



NORTHWEST PIPELINE

295 Chipeta Way
Salt Lake City, UT 84108
801/584-6736
801/584-6735 fax

October 16, 2008

Bill Rogers
Air Quality Permitting
Idaho Department of Environmental Quality
DEQ Boise Regional Office
1445 N. Orchard
Boise, ID 83706

Re: Northwest Pipeline GP – Lava Hot Springs Compressor Station
Air Quality Permit to Construct Application

Dear Mr. Rogers:

Please find enclosed an Idaho Air Quality Permit to Construct application for Northwest Pipeline GP's (Northwest's) Lava Hot Springs compressor station. The application has been prepared to increase allowable emission rates for each of the three permitted turbines. No new equipment has been added and no new physical modifications have been made to the facility.

The need for re-permitting was discovered during a routine turbine emission test. The test showed that the turbine was not meeting the NOx lbs/hour limit. The unit is functioning properly and operating as designed. However an error was discovered in the October 2001 permit-to-construct application. The turbine manufacturers predicted emission performance data sheets are included in this application. The emissions increases correspond to the predicted emissions from Solar.

I will contact you the week of October 20. I can be reached at (801) 584-6748 if you need to discuss sooner.

Sincerely,

A handwritten signature in black ink, appearing to read "Derek Forsberg".

Derek Forsberg
Environmental Scientist

CC: File – Pocatello Air MMS ID# 001714
POD – Steve Wolf MMS ID# 001714

RECEIVED

OCT 17 2008

Department of Environmental Quality
State Air Program

**AIR QUALITY PERMIT TO CONSTRUCT APPLICATION FOR
LAVA HOT SPRINGS COMPRESSOR STATION**

Submitted By:



**NORTHWEST PIPELINE GP
295 Chipeta Way
Salt Lake City, UT 84108**

Prepared By:

**CIRRUS CONSULTING, LLC
864 Windsor Court
Santa Barbara, CA 93111**

October 2008

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Appendix A

Permit Application Forms

Air Quality Permit to Construct Application
Lava Hot Springs Compressor Station
October 2008

Cirrus Consulting, LLC



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
 04/03/07

Please see instructions on page 2 before filling out the form.

| |
|--|
| DEQ USE ONLY |
| Date Received |
| Project Number |
| Payment / Fees Included? Yes <input type="checkbox"/> No <input type="checkbox"/> |
| Check Number |

| COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER | | | |
|---|--|--|--------------------------|
| 1. Company Name | Northwest Pipeline GP | | |
| 2. Facility Name | Lava Hot Springs Compressor Station | 3. Facility ID No. | 005-00028 |
| 4. Brief Project Description - One sentence or less | Increase allowable emission rates for three existing stationary combustion turbines. | | |
| PERMIT APPLICATION TYPE | | | |
| 5. <input type="checkbox"/> New Facility <input type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modify Existing Source: Permit No.: <u>005-00028</u> Date Issued: <u>06-28-2002</u> <input type="checkbox"/> Required by Enforcement Action: Case No.: _____ | | | |
| 6. <input checked="" type="checkbox"/> Minor PTC <input type="checkbox"/> Major PTC | | | |
| FORMS INCLUDED | | | |
| Included | N/A | Forms | DEQ Verify |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Form GI – Facility Information | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Form EU0 – Emissions Units General | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form EU5 – Boiler Information Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____ | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form BCE - Baghouses Control Equipment | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Form SCE - Scrubbers Control Equipment | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Forms EI-CP1 - EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets) | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | PP – Plot Plan | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets) | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Form FRA – Federal Regulation Applicability | <input type="checkbox"/> |



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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

| IDENTIFICATION | |
|--|---|
| 1. Company Name | Northwest Pipeline GP |
| 2. Facility Name (if different than #1) | Lava Hot Springs Compressor Station |
| 3. Facility I.D. No. | 005-00028 |
| 4. Brief Project Description: | Increase allowable emission rates for three existing stationary combustion turbines |
| FACILITY INFORMATION | |
| 5. Owned/operated by: (✓ if applicable) | <input type="checkbox"/> Federal government <input type="checkbox"/> County government <input type="checkbox"/> State government <input type="checkbox"/> City government |
| 6. Primary Facility Permit Contact Person/Title | Derek Forsberg |
| 7. Telephone Number and Email Address | (801) 584-6748 derek.forsberg@williams.com |
| 8. Alternate Facility Contact Person/Title | Scott Peters |
| 9. Telephone Number and Email Address | (801) 584-6288 scott.peters@williams.com |
| 10. Address to which permit should be sent | 295 Chipeta Way |
| 11. City/State/Zip | Salt Lake City, Utah 84108 |
| 12. Equipment Location Address (if different than #10) | 6680 E. Old Oregon Trail Road |
| 13. City/State/Zip | Topaz, ID 83246 |
| 14. Is the Equipment Portable? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| 15. SIC Code(s) and NAISC Code | Primary SIC: 4922 Secondary SIC (if any): NAICS: 486210 |
| 16. Brief Business Description and Principal Product | Natural Gas Transmission |
| 17. Identify any adjacent or contiguous facility that this company owns and/or operates | None |
| PERMIT APPLICATION TYPE | |
| 18. Specify Reason for Application | <input type="checkbox"/> New Facility <input type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modify Existing Source: Permit No.: 005-00028 Date Issued: 06-28-2002 <input type="checkbox"/> Permit Revision <input type="checkbox"/> Required by Enforcement Action: Case No.: |
| CERTIFICATION | |
| IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE. | |
| 19. Responsible Official's Name/Title | Barry Orgill, Director of Operations |
| 20. RESPONSIBLE OFFICIAL SIGNATURE | <i>Barry Orgill</i> Date: 10/14/08 |
| 21. <input checked="" type="checkbox"/> Check here to indicate you would like to review a draft permit prior to final issuance. | |



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Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

| IDENTIFICATION | | | | | | |
|--|----------------------|--|-----------------|---------------------------------|-----|----|
| 1. Company Name: Northwest Pipeline GP | | 2. Facility Name: Lava Hot Springs Compressor Station | | 3. Facility ID No: 005-00028 | | |
| 4. Brief Project Description: | | Increase allowable emission rates | | | | |
| EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION | | | | | | |
| 5. Emissions Unit (EU) Name: | | SOLAR CENTAUR 40-4002 TURBINE | | | | |
| 6. EU ID Number: | | T4002 | | | | |
| 7. EU Type: | | <input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:005-00028 Date Issued: 06-28-2002 | | | | |
| 8. Manufacturer: | | SOLAR TURBINES, INC. | | | | |
| 9. Model: | | 40-4002 | | | | |
| 10. Maximum Capacity: | | 3,588 HP @ 0 DEG. F (4,107 HP @ ISO CONDITIONS) | | | | |
| 11. Date of Construction: | | 1978 | | | | |
| 12. Date of Modification (if any): | | 2003 | | | | |
| 13. Is this a Controlled Emission Unit? | | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 22. | | | | |
| EMISSIONS CONTROL EQUIPMENT | | | | | | |
| 14. Control Equipment Name and ID: | | | | | | |
| 15. Date of Installation: | | 16. Date of Modification (if any): | | | | |
| 17. Manufacturer and Model Number: | | | | | | |
| 18. ID(s) of Emission Unit Controlled: | | | | | | |
| 19. Is operating schedule different than emission units(s) involved? | | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| 20. Does the manufacturer guarantee the control efficiency of the control equipment? | | <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee) | | | | |
| Control Efficiency | Pollutant Controlled | | | | | |
| | PM | PM10 | SO ₂ | NOx | VOC | CO |
| 21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. | | | | | | |
| EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other) | | | | | | |
| 22. Actual Operation: | | 8,760 HOURS PER YEAR | | | | |
| 23. Maximum Operation: | | 8,760 HOURS PER YEAR | | | | |
| REQUESTED LIMITS | | | | | | |
| 24. Are you requesting any permit limits? | | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, indicate all that apply below) | | | | |
| <input type="checkbox"/> Operation Hour Limit(s): | | | | | | |
| <input type="checkbox"/> Production Limit(s): | | | | | | |
| <input type="checkbox"/> Material Usage Limit(s): | | | | | | |
| <input type="checkbox"/> Limits Based on Stack Testing: | | Please attach all relevant stack testing summary reports | | | | |
| <input checked="" type="checkbox"/> Other: | | NOX=21.65 LB/HR, CO=19.97 LB/HR, VOC=0.46 LB/HR | | | | |
| 25. Rationale for Requesting the Limit(s): | | EMISSION LIMITS ARE BASED ON MANUFACTURER'S INFORMATION | | | | |



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Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

| IDENTIFICATION | | | | | | |
|--|----------------------|--|-----------------|---------------------------------|-----|----|
| 1. Company Name: Northwest Pipeline GP | | 2. Facility Name: Lava Hot Springs Compressor Station | | 3. Facility ID No: 005-00028 | | |
| 4. Brief Project Description: | | Increase allowable emission rates | | | | |
| EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION | | | | | | |
| 5. Emissions Unit (EU) Name: | | SOLAR CENTAUR 40-4700S TURBINE | | | | |
| 6. EU ID Number: | | T4700S | | | | |
| 7. EU Type: | | <input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:005-00028 Date Issued: 06-28-2002 | | | | |
| 8. Manufacturer: | | SOLAR TURBINES, INC. | | | | |
| 9. Model: | | 40-4700S | | | | |
| 10. Maximum Capacity: | | 4,205 HP @ 0 DEG. F (4,700 HP @ ISO CONDITIONS) | | | | |
| 11. Date of Construction: | | 2003 | | | | |
| 12. Date of Modification (if any): | | N/A | | | | |
| 13. Is this a Controlled Emission Unit? | | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 22. | | | | |
| EMISSIONS CONTROL EQUIPMENT | | | | | | |
| 14. Control Equipment Name and ID: | | | | | | |
| 15. Date of Installation: | | 16. Date of Modification (if any): | | | | |
| 17. Manufacturer and Model Number: | | | | | | |
| 18. ID(s) of Emission Unit Controlled: | | | | | | |
| 19. Is operating schedule different than emission units(s) involved? | | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| 20. Does the manufacturer guarantee the control efficiency of the control equipment? | | <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee) | | | | |
| Control Efficiency | Pollutant Controlled | | | | | |
| | PM | PM10 | SO ₂ | NO _x | VOC | CO |
| 21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. | | | | | | |
| EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other) | | | | | | |
| 22. Actual Operation: | | 8,760 HOURS PER YEAR | | | | |
| 23. Maximum Operation: | | 8,760 HOURS PER YEAR | | | | |
| REQUESTED LIMITS | | | | | | |
| 24. Are you requesting any permit limits? | | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, indicate all that apply below) | | | | |
| <input type="checkbox"/> Operation Hour Limit(s): | | | | | | |
| <input type="checkbox"/> Production Limit(s): | | | | | | |
| <input type="checkbox"/> Material Usage Limit(s): | | | | | | |
| <input type="checkbox"/> Limits Based on Stack Testing: | | Please attach all relevant stack testing summary reports | | | | |
| <input checked="" type="checkbox"/> Other: | | NO _x =3.89 LB/HR, CO=4.73 LB/HR, VOC=0.27 LB/HR | | | | |
| 25. Rationale for Requesting the Limit(s): | | EMISSION LIMITS ARE BASED ON MANUFACTURER'S INFORMATION | | | | |



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Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

| IDENTIFICATION | | | | | | |
|--|----------------------|---|-----------------|---------------------------------|-----|----|
| 1. Company Name: Northwest Pipeline GP | | 2. Facility Name: Lava Hot Springs Compressor Station | | 3. Facility ID No: 005-00028 | | |
| 4. Brief Project Description: | | Increase allowable emission rates | | | | |
| EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION | | | | | | |
| 5. Emissions Unit (EU) Name: | | SOLAR SATURN 10-1300 TURBINE | | | | |
| 6. EU ID Number: | | T1300 | | | | |
| 7. EU Type: | | <input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #: 005-00028 Date Issued: 06-28-2002 | | | | |
| 8. Manufacturer: | | SOLAR TURBINES, INC. | | | | |
| 9. Model: | | 10-1300 | | | | |
| 10. Maximum Capacity: | | 1,222 HP @ 0 DEG. F (1,300 HP @ ISO CONDITIONS) | | | | |
| 11. Date of Construction: | | N/A | | | | |
| 12. Date of Modification (if any): | | N/A | | | | |
| 13. Is this a Controlled Emission Unit? | | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 22. | | | | |
| EMISSIONS CONTROL EQUIPMENT | | | | | | |
| 14. Control Equipment Name and ID: | | | | | | |
| 15. Date of Installation: | | 16. Date of Modification (if any): | | | | |
| 17. Manufacturer and Model Number: | | | | | | |
| 18. ID(s) of Emission Unit Controlled: | | | | | | |
| 19. Is operating schedule different than emission units(s) involved? | | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| 20. Does the manufacturer guarantee the control efficiency of the control equipment? | | <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee) | | | | |
| Control Efficiency | Pollutant Controlled | | | | | |
| | PM | PM10 | SO ₂ | NO _x | VOC | CO |
| 21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. | | | | | | |
| EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other) | | | | | | |
| 22. Actual Operation: | | 8,760 HOURS PER YEAR | | | | |
| 23. Maximum Operation: | | 8,760 HOURS PER YEAR | | | | |
| REQUESTED LIMITS | | | | | | |
| 24. Are you requesting any permit limits? | | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, indicate all that apply below) | | | | |
| <input type="checkbox"/> Operation Hour Limit(s): | | | | | | |
| <input type="checkbox"/> Production Limit(s): | | | | | | |
| <input type="checkbox"/> Material Usage Limit(s): | | | | | | |
| <input type="checkbox"/> Limits Based on Stack Testing: | | Please attach all relevant stack testing summary reports | | | | |
| <input checked="" type="checkbox"/> Other: | | NO _x =7.88 LB/HR, CO=12.79 LB/HR, VOC=0.37 LB/HR | | | | |
| 25. Rationale for Requesting the Limit(s): | | EMISSION LIMITS ARE BASED ON MANUFACTURER'S INFORMATION | | | | |

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

| |
|---|
| Northwest Pipeline GP |
| Lava Hot Springs Compressor Station |
| 005-00028 |
| Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines |

1.

2.

3.

PM₁₀

$$\text{SO}_2$$

NO_x

CO

VOC

Lead

Emissions units

Stack ID

lb/hr

T/VF

lb/hr

T/vr

e/hr

[illegible]


[illegible][illegible][illegible]

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Point Source(s)

| | | | | | | | | | | | | | |
|--------------------------------|--------|------|------|------|------|-------|--------|-------|--------|------|------|-----|-----|
| Solar Centaur 40-4002 Turbine | T4002 | 0.22 | 0.96 | 0.11 | 0.48 | 21.65 | 94.83 | 19.97 | 87.47 | 0.46 | 2.01 | N/A | N/A |
| Solar Centaur 40-4700S Turbine | T4700S | 0.26 | 1.14 | 0.13 | 0.57 | 3.89 | 17.04 | 4.73 | 20.72 | 0.27 | 1.19 | N/A | N/A |
| Solar Saturn 10-1300 Turbine | T1300 | 0.09 | 0.39 | 0.05 | 0.22 | 7.88 | 34.51 | 12.79 | 56.02 | 0.37 | 1.60 | N/A | N/A |
| Sivalls Fuel Gas Heater | --- | neg. | neg. | neg. | neg. | 0.03 | 0.11 | 0.02 | 0.09 | neg. | neg. | N/A | N/A |
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| | | | | | | | | | | | | | |
| Total | | 0.57 | 2.50 | 0.29 | 1.27 | 33.45 | 146.49 | 37.51 | 164.30 | 1.10 | 4.80 | | |

| | | | | | | | | | | | | | | |
|---|---|---|------|-----------------|------|-----------------|------|-------|------|-------|------|-------|------|--|
|  | DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit Hotline - 1-877-5PERMIT | PERMIT TO CONSTRUCT APPLICATION Revision 2 4/5/2007 | | | | | | | | | | | | |
| <i>Please see instructions on page 2 before filling out the form.</i> | | | | | | | | | | | | | | |
| Company Name: | | Northwest Pipeline GP | | | | | | | | | | | | |
| Facility Name: | | Lava Hot Springs Compressor Station | | | | | | | | | | | | |
| Facility ID No.: | | 005-00028 | | | | | | | | | | | | |
| Brief Project Description: | | Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines | | | | | | | | | | | | |
| SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES | | | | | | | | | | | | | | |
| 1. | 2. | 3. | | | | | | | | | | | | |
| | | PM ₁₀ | | SO ₂ | | NO _x | | CO | | VOC | | Lead | | |
| Fugitive Source Name | Fugitive ID | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | |
| Fugitive Source(s) | | | | | | | | | | | | | | |
| name of fugitive source1 | | | | | | | | | | | | | | |
| name of fugitive source2 | | | | | | | | | | | | | | |
| name of fugitive source3 | | | | | | | | | | | | | | |
| name of fugitive source4 | | | | | | | | | | | | | | |
| name of fugitive source5 | | | | | | | | | | | | | | |
| name of fugitive source6 | | | | | | | | | | | | | | |
| name of fugitive source7 | | | | | | | | | | | | | | |
| name of fugitive source8 | | | | | | | | | | | | | | |
| name of fugitive source9 | NOT APPLICABLE | | | | | | | | | | | | | |
| name of fugitive source10 | | | | | | | | | | | | | | |
| name of fugitive source11 | | | | | | | | | | | | | | |
| name of fugitive source12 | | | | | | | | | | | | | | |
| name of fugitive source13 | | | | | | | | | | | | | | |
| name of fugitive source14 | | | | | | | | | | | | | | |
| name of fugitive source15 | | | | | | | | | | | | | | |
| name of fugitive source16 | | | | | | | | | | | | | | |
| name of fugitive source17 | | | | | | | | | | | | | | |
| name of fugitive source18 | | | | | | | | | | | | | | |
| name of fugitive source19 | | | | | | | | | | | | | | |
| name of fugitive source20 | | | | | | | | | | | | | | |
| name of fugitive source21 | | | | | | | | | | | | | | |
| (insert more rows as needed) | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | |



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PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

| | |
|---------------|-----------------------|
| Company Name: | Northwest Pipeline GP |
|---------------|-----------------------|

| | |
|----------------|-------------------------------------|
| Facility Name: | Lava Hot Springs Compressor Station |
|----------------|-------------------------------------|

Facility ID No.: 005-00028

| | |
|----------------------------|---|
| Brief Project Description: | Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines |
|----------------------------|---|

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

| 1. | 2. | 3. | | | | | | | | | | | |
|--------------------------------|----------|------------------|------|---------------|------|---------------|-------|-------|--------|--------|--------|-------|------|
| | | PM_{10} | | SO_2 | | NO_x | | CO | | VOC | | Lead | |
| Emissions units | Stack ID | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Point Source(s) | | | | | | | | | | | | | |
| Solar Centaur 40-4002 Turbine | T4002 | 0.01 | 0.04 | 0.00 | 0.00 | 8.95 | 39.20 | 15.30 | 67.01 | (0.40) | (1.76) | N/A | N/A |
| Solar Centaur 40-4700S Turbine | T4700S | 0.03 | 0.13 | 0.01 | 0.04 | 0.38 | 1.66 | 0.45 | 1.97 | (0.96) | (4.20) | N/A | N/A |
| Solar Saturn 10-1300 Turbine | T1300 | 0.01 | 0.04 | 0.01 | 0.04 | 4.56 | 19.97 | 11.36 | 49.76 | (0.47) | (2.08) | N/A | N/A |
| Sivalls Fuel Gas Heater | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
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| | | | | | | | | | | | | | |
| Total | | 0.05 | 0.22 | 0.02 | 0.09 | 13.89 | 60.84 | 27.11 | 118.74 | (1.83) | (8.03) | | |

| | | |
|---|---|--|
|  | DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit Hotline - 1-877-5PERMIT | PERMIT TO CONSTRUCT APPLICATION Revision 3 4/5/2007 |
|---|---|--|

Please see instructions on page 2 before filling out the form.

| | |
|----------------------------|---|
| Company Name: | Northwest Pipeline GP |
| Facility Name: | Lava Hot Springs Compressor Station |
| Facility ID No.: | 005-00028 |
| Brief Project Description: | Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines |

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

| 1. | 2. | 3. Air Pollutant Maximum Change in Emissions Rate (lbs/hr or t/yr) | | | | | | | | | | | |
|------------------------------|----------------|---|------|-----------------|------|-----------------|------|-------|------|-------|------|-------|------|
| | | PM ₁₀ | | SO ₂ | | NO _x | | CO | | VOC | | Lead | |
| Fugitive Source Name | Fugitive ID | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Fugitive Source(s) | | | | | | | | | | | | | |
| name of fugitive source1 | | | | | | | | | | | | | |
| name of fugitive source2 | | | | | | | | | | | | | |
| name of fugitive source3 | | | | | | | | | | | | | |
| name of fugitive source4 | | | | | | | | | | | | | |
| name of fugitive source5 | | | | | | | | | | | | | |
| name of fugitive source6 | | | | | | | | | | | | | |
| name of fugitive source7 | | | | | | | | | | | | | |
| name of fugitive source8 | | | | | | | | | | | | | |
| name of fugitive source9 | NOT APPLICABLE | | | | | | | | | | | | |
| name of fugitive source10 | | | | | | | | | | | | | |
| name of fugitive source11 | | | | | | | | | | | | | |
| name of fugitive source12 | | | | | | | | | | | | | |
| name of fugitive source13 | | | | | | | | | | | | | |
| name of fugitive source14 | | | | | | | | | | | | | |
| name of fugitive source15 | | | | | | | | | | | | | |
| name of fugitive source16 | | | | | | | | | | | | | |
| name of fugitive source17 | | | | | | | | | | | | | |
| name of fugitive source18 | | | | | | | | | | | | | |
| name of fugitive source19 | | | | | | | | | | | | | |
| name of fugitive source20 | | | | | | | | | | | | | |
| name of fugitive source21 | | | | | | | | | | | | | |
| (insert more rows as needed) | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | |



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name: Northwest Pipeline GP


Facility Name: Lava Hot Springs Compressor Station

Facility ID No.: 005-00028

Brief Project Description: Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

| | | 1. | | 2. | 3. | 4. | | 5. |
|-------------------------------|------------------|---|--|--------------------------------------|----------------------------------|------------------------------|---------------|------------------|
| Criteria Pollutants | Averaging Period | Significant Impact Analysis Results (µg/m3) | Significant Contribution Level (µg/m3) | Full Impact Analysis Results (µg/m3) | Background Concentration (µg/m3) | Total Ambient Impact (µg/m3) | NAAQS (µg/m3) | Percent of NAAQS |
| PM ₁₀ ¹ | 24-hour | N/A | 5 | N/A | N/A | N/A | 150 | N/A |
| | Annual | N/A | 1 | N/A | N/A | N/A | 50 | N/A |
| SO ₂ ¹ | 3-hr | N/A | 25 | N/A | N/A | N/A | 1300 | N/A |
| | 24-hr | N/A | 5 | N/A | N/A | N/A | 365 | N/A |
| | Annual | N/A | 1 | N/A | N/A | N/A | 80 | N/A |
| NO ₂ | Annual | 3.92 | 1 | 9.59 | 17.00 | 26.59 | 100 | 26.60 |
| CO ¹ | 1-hr | N/A | 2000 | N/A | N/A | N/A | 10000 | N/A |
| | 8-hr | N/A | 500 | N/A | N/A | N/A | 40000 | N/A |

| | | | | | | | | | | |
|---|----------|--|------------------|---|------------------|----------------------|----------------------------|----------------------------|---------------------------|--|
|  | | DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit Hotline - 1-877-5PERMIT | | PERMIT TO CONSTRUCT APPLICATION Revision 3 3/27/2007 | | | | | | |
| <i>Please see instructions on page 2 before filling out the form.</i> | | | | | | | | | | |
| Company Name: | | Northwest Pipeline GP | | | | | | | | |
| Facility Name: | | Lava Hot Springs Compressor Station | | | | | | | | |
| Facility ID No.: | | 005-00028 | | | | | | | | |
| Brief Project Description: | | Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines | | | | | | | | |
| POINT SOURCE STACK PARAMETERS | | | | | | | | | | |
| 1. | 2. | 3a. | 3b. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
| Emissions units | Stack ID | UTM Easting (m) | UTM Northing (m) | Base Elevation (m) | Stack Height (m) | Modeled Diameter (m) | Stack Exit Temperature (K) | Stack Exit Flowrate (acfm) | Stack Exit Velocity (m/s) | Stack orientation (e.g., horizontal, rain cap) |
| Point Source(s) | | | | | | | | | | |
| Solar Centaur 40-4002 Turbine | T4002 | 410,623 | 4,720,193 | 1,511.10 | 9.66 | 1.07 | 683.71 | 72,880 | 38.48 | Vertical |
| Solar Centaur 40-4700S Turbine | T4700S | 410,623 | 4,720,167 | 1,510.60 | 12.68 | 1.04 | 710.37 | 83,070 | 46.48 | Vertical |
| Solar Saturn 10-1300 Turbine | T1300 | 410,584 | 4,720,155 | 1,509.20 | 7.92 | 0.74 | 740.37 | 29,615 | 32.71 | Vertical |
| name of the emissions unit4 | | | | | | | | | | |
| name of the emissions unit5 | | | | | | | | | | |
| name of the emissions unit6 | | | | | | | | | | |
| name of the emissions unit7 | | | | | | | | | | |
| name of the emissions unit8 | | | | | | | | | | |
| name of the emissions unit9 | | | | | | | | | | |
| name of the emissions unit10 | | | | | | | | | | |
| name of the emissions unit11 | | | | | | | | | | |
| name of the emissions unit12 | | | | | | | | | | |
| name of the emissions unit13 | | | | | | | | | | |
| name of the emissions unit14 | | | | | | | | | | |
| name of the emissions unit15 | | | | | | | | | | |
| name of the emissions unit16 | | | | | | | | | | |
| name of the emissions unit17 | | | | | | | | | | |
| name of the emissions unit18 | | | | | | | | | | |
| name of the emissions unit19 | | | | | | | | | | |
| name of the emissions unit20 | | | | | | | | | | |
| name of the emissions unit21 | | | | | | | | | | |
| (insert more rows as needed) | | | | | | | | | | |



DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name: Northwest Pipeline GP

Facility Name: Lava Hot Springs Compressor Station

Facility ID No.: 005-00028

Brief Project Description: Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines

FUGITIVE SOURCE PARAMETERS

| 1. | 2. | 3a. | 3b. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|------------------------------|-----------------------|-----------------|------------------|--------------------|--------------------|---------------------|----------------------|----------------------|--------------------------------|----------------------------------|
| Emissions units | Stack ID | UTM Easting (m) | UTM Northing (m) | Base Elevation (m) | Release Height (m) | Easterly Length (m) | Northerly Length (m) | Angle from North (°) | Initial Vertical Dimension (m) | Initial Horizontal Dimension (m) |
| Area Source(s) | | | | | | | | | | |
| name of the emissions unit1 | | | | | | | | | | |
| name of the emissions unit2 | | | | | | | | | | |
| name of the emissions unit3 | | | | | | | | | | |
| name of the emissions unit4 | | | | | | | | | | |
| name of the emissions unit5 | NOT APPLICABLE | | | | | | | | | |
| name of the emissions unit6 | | | | | | | | | | |
| name of the emissions unit7 | | | | | | | | | | |
| name of the emissions unit8 | | | | | | | | | | |
| name of the emissions unit9 | | | | | | | | | | |
| name of the emissions unit10 | | | | | | | | | | |
| Volume Source(s) | | | | | | | | | | |
| name of the emissions unit11 | | | | | | | | | | |
| name of the emissions unit12 | | | | | | | | | | |
| name of the emissions unit13 | | | | | | | | | | |
| name of the emissions unit14 | | | | | | | | | | |
| name of the emissions unit15 | | | | | | | | | | |
| name of the emissions unit16 | NOT APPLICABLE | | | | | | | | | |
| name of the emissions unit17 | | | | | | | | | | |
| name of the emissions unit18 | | | | | | | | | | |
| name of the emissions unit19 | | | | | | | | | | |
| (insert more rows as needed) | | | | | | | | | | |

Please see instructions on page 2 before filling out the form.

| | |
|----------------------------|---|
| Brief Project Description: | Increase Allowable Emission Rates for Three Existing Stationary Combustion Turbines |
|----------------------------|---|

1.

2.

3.

4.

5.

6.

7.

Length (ft)

Width (ft)

Base
Elevation (m)

**Building
Height (m)**

Number of Tiers

| | Description/Comments |
|-----|----------------------|
| 1 | 10/10/2018 |
| 2 | 10/10/2018 |
| 3 | 10/10/2018 |
| 4 | 10/10/2018 |
| 5 | 10/10/2018 |
| 6 | 10/10/2018 |
| 7 | 10/10/2018 |
| 8 | 10/10/2018 |
| 9 | 10/10/2018 |
| 10 | 10/10/2018 |
| 11 | 10/10/2018 |
| 12 | 10/10/2018 |
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| 91 | 10/10/2018 |
| 92 | 10/10/2018 |
| 93 | 10/10/2018 |
| 94 | 10/10/2018 |
| 95 | 10/10/2018 |
| 96 | 10/10/2018 |
| 97 | 10/10/2018 |
| 98 | 10/10/2018 |
| 99 | 10/10/2018 |
| 100 | 10/10/2018 |

CMPBLDG

70.00

40.00

1510.40

10.06

| | |
|---|---------------------|
| 1 | Compressor Building |
|---|---------------------|

AUXBLDG

48.00

30.00

1509.50

6.40

| | |
|---|--------------------|
| 1 | Auxiliary Building |
|---|--------------------|

SOUNDWLL

50.00

5.00

1508.70

4.57

| | |
|---|------------|
| 1 | Sound Wall |
|---|------------|

SATURN

23.00

6.30

1509.20

2.11

| | |
|---|---------------------|
| 1 | Saturn Turbine Skid |
|---|---------------------|

METERHSE

15.00

20.00

1510.00

4.57

| | |
|---|-------------|
| 1 | Meter House |
|---|-------------|



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

AIR PERMIT APPLICATION

Revision 5
 09/08/08

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

| IDENTIFICATION | |
|--|--|
| 1. Company Name: Northwest Pipeline GP | 2. <u>Facility Name</u> : Lava Hot Springs Compressor Station |
| 3. <u>Facility ID No.</u> : 005-00028 | |
| 4. <u>Brief Project Description</u> : Increase allowable emission rates for three existing stationary combustion turbines | |
| APPLICABILITY DETERMINATION | |
| 5. Review <u>current federal regulations</u> and identify federal regulations that apply or appear to apply to the facility. You will list applicable regulations below in items 6-8. | <input type="checkbox"/> The facility is not subject to any federal regulations. If you checked this box, the form is now complete. <input checked="" type="checkbox"/> Federal regulation(s) applies. Continue with item 6. |
| 6. List <u>applicable subpart(s)</u> of the New Source Performance Standards (NSPS) (40 CFR part 60). | List of applicable subpart(s): GG <input type="checkbox"/> Not applicable. |
| 7. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP), also called Maximum Achievable Control Technology (MACT), found in 40 CFR part 63. | List of applicable subpart(s): <input checked="" type="checkbox"/> Not applicable. |
| 8. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR part 61. | List of applicable subpart(s): <input checked="" type="checkbox"/> Not applicable. |
| 9. For each subpart identified above, conduct a <u>complete regulatory analysis</u> . | <input type="checkbox"/> Regulatory analysis complete. <input type="checkbox"/> Not applicable. Explain why: |
| 10. Will this facility be subject to <u>compliance assurance monitoring</u> (CAM) (40 CFR 64) as a result of this permitting action? | <input checked="" type="checkbox"/> NO, the facility is not subject to CAM at the time of this permitting action. Please explain why: No add-on control devices are used <input type="checkbox"/> YES If yes, please fill out DEQ <u>Form CAM</u> . <input type="checkbox"/> Not applicable. |
| 11. List applicable part(s) and subpart(s) of <u>other federal regulations</u> that are not included in items 7 through 9, and conduct a <u>complete regulatory analysis</u> . | List of all applicable part(s) and subpart(s): <input checked="" type="checkbox"/> Not applicable. |
| IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT | |

Appendix B
Emission Calculations and Supporting Documentation

Air Quality Permit to Construct Application
Lava Hot Springs Compressor Station
October 2008

Cirrus Consulting, LLC

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | |
|-----------------------------------|------------------------------|
| Customer | |
| Job ID | |
| Inquiry Number | |
| Run By David A Pocengal | Date Run 18-Aug-08 |

| | |
|--|------------------------------|
| Engine Model CENTAUR 40-4000 CS/MD STANDARD NEW STANDARD (PIP) COMBUSTOR | |
| Fuel Type SD NATURAL GAS | Water Injection NO |
| Engine Emissions Data REV. 0.0 | |

| NOx EMISSIONS | CO EMISSIONS | UHC EMISSIONS |
|---------------|--------------|---------------|
|---------------|--------------|---------------|

| 1 | 3588 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 0 Deg. F |
|-----------------------------------|---------|-------------|---------------|---------------------|----------------------|
| PPMvd at 15% O2 | 165.00 | 250.00 | 50.00 | | |
| ton/yr | 94.84 | 87.49 | 10.02 | | |
| lbm/MMBtu (Fuel LHV) | 0.661 | 0.610 | 0.070 | | |
| lbm/(MW-hr) | 8.09 | 7.47 | 0.86 | | |
| (gas turbine shaft pwr) lbm/hr | 21.65 | 19.97 | 2.29 | | |

| 2 | 3478 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 20.0 Deg. F |
|-----------------------------------|---------|-------------|---------------|---------------------|-------------------------|
| PPMvd at 15% O2 | 165.00 | 250.00 | 50.00 | | |
| ton/yr | 92.43 | 85.26 | 9.77 | | |
| lbm/MMBtu (Fuel LHV) | 0.660 | 0.609 | 0.070 | | |
| lbm/(MW-hr) | 8.14 | 7.51 | 0.86 | | |
| (gas turbine shaft pwr) lbm/hr | 21.10 | 19.46 | 2.23 | | |

| 3 | 3353 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 40.0 Deg. F |
|-----------------------------------|---------|-------------|---------------|---------------------|-------------------------|
| PPMvd at 15% O2 | 165.00 | 250.00 | 50.00 | | |
| ton/yr | 89.93 | 82.96 | 9.50 | | |
| lbm/MMBtu (Fuel LHV) | 0.659 | 0.608 | 0.070 | | |
| lbm/(MW-hr) | 8.21 | 7.58 | 0.87 | | |
| (gas turbine shaft pwr) lbm/hr | 20.53 | 18.94 | 2.17 | | |

Notes

- For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
- Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
- Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
- If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
- Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
- Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | | | |
|-------------------------|--|-------------------------------------|-----------------|
| Customer | | Engine Model | |
| Job ID | | CENTAUR 40-4000 | |
| Inquiry Number | | CS/MD STANDARD | |
| Run By | | NEW STANDARD (PIP) COMBUSTOR | |
| Date Run | | Fuel Type | Water Injection |
| David A Pocengal | | SD NATURAL GAS | NO |
| 18-Aug-08 | | Engine Emissions Data | |
| | | REV. 0.0 | |

| NOx EMISSIONS | | | | CO EMISSIONS | | UHC EMISSIONS | |
|-------------------------|---------|-------------|---------------|---------------------|--------------------------|---------------|--|
| 4 | 3212 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 60.0 Deg. F | | |
| PPMvd at 15% O2 | | 165.00 | | 250.00 | | 50.00 | |
| ton/yr | | 87.19 | | 80.42 | | 9.21 | |
| lbm/MMBtu (Fuel LHV) | | 0.656 | | 0.605 | | 0.069 | |
| lbm/(MW-hr) | | 8.31 | | 7.67 | | 0.88 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 19.91 | | 18.36 | | 2.10 | |
| 5 | 3086 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 80.0 Deg. F | | |
| PPMvd at 15% O2 | | 165.00 | | 250.00 | | 50.00 | |
| ton/yr | | 84.98 | | 78.39 | | 8.98 | |
| lbm/MMBtu (Fuel LHV) | | 0.651 | | 0.601 | | 0.069 | |
| lbm/(MW-hr) | | 8.43 | | 7.78 | | 0.89 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 19.40 | | 17.90 | | 2.05 | |
| 6 | 2834 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 100.0 Deg. F | | |
| PPMvd at 15% O2 | | 165.00 | | 250.00 | | 50.00 | |
| ton/yr | | 79.88 | | 73.68 | | 8.44 | |
| lbm/MMBtu (Fuel LHV) | | 0.642 | | 0.592 | | 0.068 | |
| lbm/(MW-hr) | | 8.63 | | 7.96 | | 0.91 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 18.24 | | 16.82 | | 1.93 | |

Notes

- For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
- Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
- Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
- If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
- Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
- Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED ENGINE PERFORMANCE

| | |
|---|--|
| Customer | |
| Job ID | |
| Run By David A Pocengal | Date Run 18-Aug-08 |
| Engine Performance Code REV. 3.40 | Engine Performance Data REV. 0.1 |

| |
|------------------------------------|
| Model CENTAUR 40-4000 |
| Package Type CS/MD |
| Match STANDARD |
| Fuel System GAS |
| Fuel Type SD NATURAL GAS |

DATA FOR NOMINAL PERFORMANCE

| | | | | | | | |
|--------------------------|-----------|--------|--------|--------|--------|--------|--------|
| Elevation | feet | 4910 | | | | | |
| Inlet Loss | in H2O | 3.0 | | | | | |
| Exhaust Loss | in H2O | 3.0 | | | | | |
| Accessory on GP Shaft | HP | 14.0 | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Engine Inlet Temperature | deg F | 0 | 20.0 | 40.0 | 60.0 | 80.0 | 100.0 |
| Relative Humidity | % | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| Driven Equipment Speed | RPM | 15028 | 15048 | 15075 | 15042 | 15038 | 14869 |
| Specified Load | HP | FULL | FULL | FULL | FULL | FULL | FULL |
| Net Output Power | HP | 3588 | 3478 | 3353 | 3212 | 3086 | 2834 |
| Fuel Flow | mmBtu/hr | 32.77 | 31.96 | 31.16 | 30.33 | 29.79 | 28.40 |
| Heat Rate | Btu/HP-hr | 9134 | 9191 | 9294 | 9444 | 9653 | 10021 |
| Therm Eff | % | 27.858 | 27.684 | 27.378 | 26.943 | 26.360 | 25.390 |
| Engine Exhaust Flow | lbm/hr | 125827 | 121663 | 117744 | 113690 | 109103 | 103656 |
| Exhaust Temperature | deg F | 710 | 741 | 771 | 803 | 831 | 853 |

| | | |
|---------------------------------------|------------------------|--------|
| Fuel Gas Composition (Volume Percent) | Methane (CH4) | 92.79 |
| | Ethane (C2H6) | 4.16 |
| | Propane (C3H8) | 0.84 |
| | N-Butane (C4H10) | 0.18 |
| | N-Pentane (C5H12) | 0.04 |
| | Hexane (C6H14) | 0.04 |
| | Carbon Dioxide (CO2) | 0.44 |
| | Hydrogen Sulfide (H2S) | 0.0001 |
| | Nitrogen (N2) | 1.51 |

| | | | | | | |
|---------------------|---------------|-------|------------------|--------|--------------------|--------|
| Fuel Gas Properties | LHV (Btu/Scf) | 939.2 | Specific Gravity | 0.5970 | Wobbe Index at 60F | 1215.6 |
|---------------------|---------------|-------|------------------|--------|--------------------|--------|

This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | | | |
|-----------------------------------|------------------------------|--|------------------------------|
| Customer | | Engine Model CENTAUR 40-4700S | |
| Job ID | | CS/MD 59F MATCH | |
| Inquiry Number | | Fuel Type SD NATURAL GAS | Water Injection NO |
| Run By David A Pocengal | Date Run 18-Aug-08 | Engine Emissions Data REV. 0.1 | |

| | | NOx EMISSIONS | | CO EMISSIONS | | UHC EMISSIONS | |
|-------------------------|----------------------------|----------------------|----------------------------|--------------------------------|--|---------------|--|
| 1 | 4205 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 17.02 | 20.73 | 5.94 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.100 | 0.122 | 0.035 | | | |
| lbm/(MW-hr) | | 1.24 | 1.51 | 0.43 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 3.89 | 4.73 | 1.36 | | | |
| 2 | 4101 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 20.0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 16.58 | 20.19 | 5.78 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.100 | 0.122 | 0.035 | | | |
| lbm/(MW-hr) | | 1.24 | 1.51 | 0.43 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 3.79 | 4.61 | 1.32 | | | |
| 3 | 3982 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 40.0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 16.09 | 19.59 | 5.61 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.100 | 0.122 | 0.035 | | | |
| lbm/(MW-hr) | | 1.24 | 1.51 | 0.43 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 3.67 | 4.47 | 1.28 | | | |

Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | | | |
|-----------------------------------|------------------------------|--|------------------------------|
| Customer | | Engine Model CENTAUR 40-4700S | |
| Job ID | | CS/MD 59F MATCH | |
| Inquiry Number | | Fuel Type SD NATURAL GAS | Water Injection NO |
| Run By David A Pocengal | Date Run 18-Aug-08 | Engine Emissions Data REV. 0.1 | |

| | | NOx EMISSIONS | | CO EMISSIONS | | UHC EMISSIONS | |
|-------------------------|----------------------------|----------------------|----------------------------|---------------------------------|--|---------------|--|
| 4 | 3794 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 60.0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 15.34 | 18.68 | 5.35 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.100 | 0.121 | 0.035 | | | |
| lbm/(MW-hr) | | 1.24 | 1.51 | 0.43 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 3.50 | 4.26 | 1.22 | | | |
| 5 | 3374 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 80.0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 14.02 | 17.07 | 4.89 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.099 | 0.120 | 0.034 | | | |
| lbm/(MW-hr) | | 1.27 | 1.55 | 0.44 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 3.20 | 3.90 | 1.12 | | | |
| 6 | 2910 Hp 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 100.0 Deg. F | | | |
| PPMvd at 15% O2 | | 25.00 | 50.00 | 25.00 | | | |
| ton/yr | | 12.53 | 15.25 | 4.37 | | | |
| lbm/MMBtu (Fuel LHV) | | 0.097 | 0.118 | 0.034 | | | |
| lbm/(MW-hr) | | 1.32 | 1.61 | 0.46 | | | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 2.86 | 3.48 | 1.00 | | | |

Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED ENGINE PERFORMANCE

| | |
|---|--|
| Customer | |
| Job ID | |
| Run By David A Pocengal | Date Run 18-Aug-08 |
| Engine Performance Code REV. 3.40 | Engine Performance Data REV. 2.2 |

| |
|------------------------------------|
| Model CENTAUR 40-4700S |
| Package Type CS/MD |
| Match 59F MATCH |
| Fuel System GAS |
| Fuel Type SD NATURAL GAS |

DATA FOR NOMINAL PERFORMANCE

| | | |
|-----------------------|--------|-------------|
| Elevation | feet | 4910 |
| Inlet Loss | in H2O | 3.0 |
| Exhaust Loss | in H2O | 3.0 |
| Accessory on GP Shaft | HP | 14.0 |

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|
| Engine Inlet Temperature | deg F | 0 | 20.0 | 40.0 | 60.0 | 80.0 | 100.0 |
| Relative Humidity | % | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| Driven Equipment Speed | RPM | 15500 | 15500 | 15500 | 15500 | 15500 | 14979 |
| Specified Load | HP | FULL | FULL | FULL | FULL | FULL | FULL |
| Net Output Power | HP | 4205 | 4101 | 3982 | 3794 | 3374 | 2910 |
| Fuel Flow | mmBtu/hr | 38.78 | 37.82 | 36.76 | 35.20 | 32.43 | 29.39 |
| Heat Rate | Btu/HP-hr | 9222 | 9222 | 9231 | 9276 | 9611 | 10100 |
| Therm Eff | % | 27.591 | 27.590 | 27.564 | 27.429 | 26.474 | 25.192 |
| Engine Exhaust Flow | lbm/hr | 137877 | 133587 | 129182 | 123861 | 115553 | 106226 |
| Exhaust Temperature | deg F | 779 | 798 | 819 | 840 | 856 | 873 |

| | | |
|---------------------------------------|-------------------------------|---------------|
| Fuel Gas Composition (Volume Percent) | Methane (CH4) | 92.79 |
| | Ethane (C2H6) | 4.16 |
| | Propane (C3H8) | 0.84 |
| | N-Butane (C4H10) | 0.18 |
| | N-Pentane (C5H12) | 0.04 |
| | Hexane (C6H14) | 0.04 |
| | Carbon Dioxide (CO2) | 0.44 |
| | Hydrogen Sulfide (H2S) | 0.0001 |
| | Nitrogen (N2) | 1.51 |

| | | | | | | |
|---------------------|----------------------|--------------|-------------------------|---------------|---------------------------|---------------|
| Fuel Gas Properties | LHV (Btu/Scf) | 939.2 | Specific Gravity | 0.5970 | Wobbe Index at 60F | 1215.6 |
|---------------------|----------------------|--------------|-------------------------|---------------|---------------------------|---------------|

This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | | | |
|------------------|--|-----------------------------|-----------------|
| Customer | | Engine Model | |
| Job ID | | SATURN 10-1300 | |
| Inquiry Number | | CS/MD STANDARD | |
| Run By | | ORIGINAL STANDARD COMBUSTOR | |
| Date Run | | Fuel Type | Water Injection |
| David A Pocengal | | SD NATURAL GAS | NO |
| 2-Oct-08 | | Engine Emissions Data | |
| | | REV. 0.1 | |

| NOx EMISSIONS | | | | CO EMISSIONS | | UHC EMISSIONS | |
|-------------------------|---------|-------------|---------------|---------------------|-------------------------|---------------|--|
| 1 | 1222 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 34.50 | | 56.01 | | 8.02 | |
| lbm/MMBtu (Fuel LHV) | | 0.601 | | 0.976 | | 0.140 | |
| lbm/(MW-hr) | | 8.65 | | 14.04 | | 2.01 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 7.88 | | 12.79 | | 1.83 | |
| 2 | 1181 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 20.0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 33.64 | | 54.62 | | 7.82 | |
| lbm/MMBtu (Fuel LHV) | | 0.601 | | 0.975 | | 0.140 | |
| lbm/(MW-hr) | | 8.72 | | 14.16 | | 2.03 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 7.68 | | 12.47 | | 1.79 | |
| 3 | 1137 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 40.0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 32.76 | | 53.19 | | 7.62 | |
| lbm/MMBtu (Fuel LHV) | | 0.600 | | 0.973 | | 0.139 | |
| lbm/(MW-hr) | | 8.82 | | 14.32 | | 2.05 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 7.48 | | 12.14 | | 1.74 | |

Notes

- For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
- Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
- Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
- If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
- Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
- Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

| | | | |
|-------------------------|--|------------------------------------|-----------------|
| Customer | | Engine Model | |
| Job ID | | SATURN 10-1300 | |
| Inquiry Number | | CS/MD STANDARD | |
| Run By | | ORIGINAL STANDARD COMBUSTOR | |
| Date Run | | Fuel Type | Water Injection |
| David A Pocengal | | SD NATURAL GAS | NO |
| 2-Oct-08 | | Engine Emissions Data | |
| | | REV. 0.1 | |

| NOx EMISSIONS | | | | CO EMISSIONS | | UHC EMISSIONS | |
|-------------------------|---------|-------------|---------------|---------------------|--------------------------|---------------|--|
| 4 | 1085 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 60.0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 31.66 | | 51.40 | | 7.36 | |
| lbm/MMBtu (Fuel LHV) | | 0.597 | | 0.969 | | 0.139 | |
| lbm/(MW-hr) | | 8.94 | | 14.51 | | 2.08 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 7.23 | | 11.74 | | 1.68 | |
| 5 | 1016 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 80.0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 30.11 | | 48.88 | | 7.00 | |
| lbm/MMBtu (Fuel LHV) | | 0.592 | | 0.962 | | 0.138 | |
| lbm/(MW-hr) | | 9.08 | | 14.73 | | 2.11 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 6.87 | | 11.16 | | 1.60 | |
| 6 | 925 Hp | 100.0% Load | Elev. 4910 ft | Rel. Humidity 60.0% | Temperature 100.0 Deg. F | | |
| PPMvd at 15% O2 | | 150.00 | | 400.00 | | 100.00 | |
| ton/yr | | 27.98 | | 45.43 | | 6.50 | |
| lbm/MMBtu (Fuel LHV) | | 0.584 | | 0.948 | | 0.136 | |
| lbm/(MW-hr) | | 9.26 | | 15.03 | | 2.15 | |
| (gas turbine shaft pwr) | | | | | | | |
| lbm/hr | | 6.39 | | 10.37 | | 1.49 | |

Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines

A Caterpillar Company

PREDICTED ENGINE PERFORMANCE

| | |
|---|--|
| Customer | |
| Job ID | |
| Run By David A Pocengal | Date Run 2-Oct-08 |
| Engine Performance Code REV. 3.40 | Engine Performance Data REV. 0.1 |

| |
|------------------------------------|
| Model SATURN 10-1300 |
| Package Type CS/MD |
| Match STANDARD |
| Fuel System GAS |
| Fuel Type SD NATURAL GAS |

DATA FOR NOMINAL PERFORMANCE

| | | | | | | | |
|--------------------------|-----------|--------|--------|--------|--------|--------|--------|
| Elevation | feet | 4910 | | | | | |
| Inlet Loss | in H2O | 3.0 | | | | | |
| Exhaust Loss | in H2O | 3.0 | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Engine Inlet Temperature | deg F | 0 | 20.0 | 40.0 | 60.0 | 80.0 | 100.0 |
| Relative Humidity | % | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| Driven Equipment Speed | RPM | 22300 | 22300 | 22300 | 22300 | 22300 | 22300 |
| Specified Load | HP | FULL | FULL | FULL | FULL | FULL | FULL |
| Net Output Power | HP | 1222 | 1181 | 1137 | 1085 | 1016 | 925 |
| Fuel Flow | mmBtu/hr | 13.10 | 12.79 | 12.48 | 12.11 | 11.60 | 10.94 |
| Heat Rate | Btu/HP-hr | 10722 | 10829 | 10970 | 11160 | 11422 | 11819 |
| Therm Eff | % | 23.730 | 23.496 | 23.194 | 22.799 | 22.277 | 21.528 |
| Engine Exhaust Flow | lbm/hr | 47020 | 45636 | 44199 | 42643 | 40880 | 38800 |
| Exhaust Temperature | deg F | 824 | 848 | 873 | 896 | 914 | 924 |

| | | |
|--|------------------------|--------|
| Fuel Gas Composition (Volume Percent) | Methane (CH4) | 92.79 |
| | Ethane (C2H6) | 4.16 |
| | Propane (C3H8) | 0.84 |
| | N-Butane (C4H10) | 0.18 |
| | N-Pentane (C5H12) | 0.04 |
| | Hexane (C6H14) | 0.04 |
| | Carbon Dioxide (CO2) | 0.44 |
| | Hydrogen Sulfide (H2S) | 0.0001 |
| | Nitrogen (N2) | 1.51 |

| | | | | | | |
|---------------------|---------------|-------|------------------|--------|--------------------|--------|
| Fuel Gas Properties | LHV (Btu/Scf) | 939.2 | Specific Gravity | 0.5970 | Wobbe Index at 60F | 1215.6 |
|---------------------|---------------|-------|------------------|--------|--------------------|--------|

This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Turbine Exhaust Characteristics**

| Turbine Model | Centaur 4002 | Centaur 4700S | Saturn 1300 |
|-------------------------------|--------------|---------------|-------------|
| Fuel Type | Gas | Gas | Gas |
| Stack Area (ft ²) | 9.62 | 9.08 | 4.60 |
| Equivalent Stack Dia (ft) | 3.50 | 3.40 | 2.42 |
| Ambient temperature (F) | 40 | 40 | 40 |
| Station Elevation (ft) | 4958 | 4956 | 4951 |
| Station Pressure (psia) | 12.246 | 12.247 | 12.249 |
| | Full Load | Full Load | Full Load |
| Stack Parameters | | | |
| Exhaust Flow (lb/hr) | 117,744 | 129,182 | 44,199 |
| Exhaust Flow (acfm) | 72,881 | 83,073 | 29,617 |
| Exhaust Velocity (ft/sec) | 126.25 | 152.50 | 107.32 |
| Exhaust Temperature (F) | 771 | 819 | 873 |
| Avg. Gas Mol. Wt. = | 29.00 | 29.00 | 29.00 |

Conversion from lb/hr to acfm is as follows:

$$\text{acfm} = (\text{lb/hr}) / (60 \text{ min}) \times (379 \text{ scf/lbmol}) / (\text{Mol Wt, lb/lbmol}) \times \{ \text{actual temp}[R] / \text{std temp}[R] \} \times \{ \text{std press}[psia] / \text{actual press}[psia] \}$$

where standard temperature = 520R and standard pressure = 14.7 psia

Appendix C
Modeling Report

Air Quality Permit to Construct Application
Lava Hot Springs Compressor Station
October 2008

Cirrus Consulting, LLC

Air Quality Dispersion Modeling Report

Northwest Pipeline GP

Lava Hot Springs Compressor Station

INTRODUCTION

This report documents the dispersion modeling techniques used to assess air quality impacts from operation of the existing Northwest Pipeline GP Lava Hot Springs Compressor Station (Lava Hot Springs). Nitrogen dioxide (NO₂) impacts from emission sources at the station are evaluated. The analysis evaluates compliance with applicable national ambient air quality standards (NAAQS).

The modeling was conducted using the latest version of the Environmental Protection Agency's (EPA) AMS/EPA Regulatory Model (AERMOD) and meteorological data collected at the Pocatello airport during 1988 through 1992. The modeling followed the methodologies outlined in an air dispersion modeling protocol submitted to, and approved by, the Idaho Department of Environmental Quality, Air Quality Division (IDEQ-AQD). Impacts were compared with the applicable standards.

The analysis demonstrates that operation of the modified station will not cause or contribute to an exceedance of the applicable federal and state standards.

FACILITY

The station is equipped to transport natural gas. The following sources are permitted to operate at the facility:

- One (1) Solar Centaur 40-4002 stationary combustion turbine;
- One (1) Solar Centaur 40-4700S stationary combustion turbine;
- One (1) Saturn 10-1300 stationary combustion turbine (skid-mounted); and
- Storage tanks, pipe racks, and miscellaneous gas transmission equipment.

The proposed modification is to increase allowable emission rates for each existing turbine at the site to reflect current predicted emissions data provided by Solar Turbines, Inc.

The Lava Hot Springs Compressor Station is located in Bannock County in southeastern Idaho, approximately seven miles west of Lava Hot Springs at Universal Transverse Mercator (UTM) coordinates of 410,600 meters Easting, 4,720,100 meters Northing, Zone 12 (North American Datum 1927 [NAD 27]), at an elevation of approximately 4,960 feet above mean sea level.

The location of the facility was identified from a legal description. Based on the plot plan, UTM coordinates were determined for the fence line, structures and sources. The legal description and plot plan are provided in Appendix E of this permit application. A topographic map showing terrain around the facility is provided in Appendix F of this permit application.

EMISSIONS

Table 1 identifies current allowable emissions, projected allowable emissions, and the emission increases from the facility as a result of the modification:

Table 1
Lava Hot Springs Compressor Station Allowable Emissions

| Pollutant | Current Emissions (tons/yr) | Projected Emissions (tons/yr) | Emissions Increase (tons/yr) |
|------------------|--------------------------------|----------------------------------|---------------------------------|
| NO _x | 85.8 | 146.5 | 60.7 |
| CO | 45.6 | 164.3 | 118.7 |
| VOC | 12.8 | 4.8 | -8.0 |
| SO ₂ | 1.2 | 1.3 | 0.1 |
| PM ₁₀ | 2.3 | 2.5 | 0.2 |

Current emissions are based on allowable emission rates taken directly from Permit to Construct No. 005-00028 and the supporting technical analysis. Projected emissions are taken from this application. Emissions increases are the projected emissions minus the current emissions. Note that there is a volatile organic compounds (VOC) emissions decrease associated with the project as VOC emissions from the three existing turbines are being modified to incorporate Solar Turbine's recommendation that VOC emissions are 20 percent of unburned hydrocarbon (UHC) emissions.

Per direction received from the IDEQ-AQD, NO₂ modeling was required based on the proposed emission increases. Modeling of other pollutants was not required as the increase in emissions are below the significant emission rate thresholds. Modeling of toxic air pollutants (TAPs) was not performed as there will no be increase in TAP emissions.

There is one small Sivalls fuel gas heater at the site with design rating of 250,000 Btu/hr. This emission source was excluded from the modeling as the heater's uncontrolled emissions are very small compared to the total facility-wide emissions and are not expected to impact the maximum-modeled ambient concentration.

The Lava Hot Springs Compressor Station is not a designated facility as defined in IDAPA 58.01.01.006.30. The project is not subject to Prevention of Significant Deterioration (PSD) requirements since the potential to emit of any regulated pollutant does not exceed the 250 ton per year PSD major source threshold. Based on the proposed project and its associated emissions, the requirements of IDAPA 58.01.01.200 through 58.01.01.228 are applicable.

STANDARDS

NO₂ emissions were evaluated for compliance with the NAAQS. Table 2 identifies the applicable significant impact level (SIL) and NAAQS:

Table 2
SIL and NAAQS

| Pollutant | Averaging Period | Significant Impact Level ($\mu\text{g}/\text{m}^3$) | NAAQS ($\mu\text{g}/\text{m}^3$) |
|-----------------|------------------|---|------------------------------------|
| NO ₂ | Annual | 1.0 | 100 |

METHODOLOGY

Modeling was conducted in accordance with the *State of Idaho Air Quality Modeling Guideline*, revised December 2002 and Environmental Protection Agency (EPA) guidance. First, the NO_x emissions increase from the Lava Hot Springs sources was modeled to determine if the project had a significant impact. As NO_x impacts exceeded the SIL, for all years modeled, cumulative NO₂ impacts were determined using all Lava Hot Springs emissions and an applicable ambient background concentration. Cumulative impacts were then compared with the applicable NAAQS.

DISPERSION MODEL

The modeling was conducted using the latest version of EPA AERMOD (version 07026). AERMOD is designed for use with point, area, and volume sources situated in terrain where ground-level elevations can exceed the stack heights of the emission sources. The model treats complex phenomena such as building-induced plume downwash and the gravitational settling and deposition of particulate matter.

The Beeline Software BEEST for Windows modeling manager was used to prepare the input files and manage processing. All EPA recommended defaults were used.

Since land use within three kilometers of the facility is greater than 50 percent rural, AERMOD was not run using the Urban Modeling Option (URBANOPT), in accordance with the Auer land use classification methodology in the EPA *Guideline on Air Quality Models*.

The coordinate system used to reference both source and receptor locations was of the UTM convention referenced to NAD27 map datum. Terrain elevation data was obtained from the most recent United States Geological Survey digitized terrain elevation data with 10-meter horizontal resolution.

SOURCES

Emissions from the Lava Hot Springs turbines were included in the modeling analysis. The generation of pollutant emissions, as well as the turbine exhaust flow characteristics, is affected by operating load and ambient air conditions. Based on gas transmission requirements, operation of the turbines at loads near 100 percent of base load is normal.

Operation at loads significantly less than 100 percent of base load is not anticipated for significant periods of time and will be associated with turbine startup or shutdown periods.

Emissions used in permitting and air dispersion modeling are based on 100 percent load operation. As turbine exhaust emissions increase with decreasing ambient air temperature, emissions associated with the 0°F ambient temperature case were used in permitting and modeling. Use of the 0°F emission rate is worst-case as the average annual temperature for the project site is 46°F. Turbine exhaust stack characteristics (exhaust temperature and exhaust velocity) were based on the 40°F ambient air temperature case as the NO₂ ambient air quality standard is based on an annual averaging period and the annual average temperature at the project site is 46°F.

The modeled Lava Hot Springs source locations, stack parameters, and emission rates are provided in Table 5 at the end of this report. A plot showing the location of the sources in relation to the structures and fenceline is provided in Figure 7 at the end of this report.

BUILDING DOWNWASH

The EPA's Building Profile Input Program - Prime (BPIP-Prime) was used to evaluate structures for building downwash impacts. All structures of sufficient height and/or width to produce downwash effects at the stacks were included in the evaluation.

Table 6 at the end of this report identifies the structure locations and dimensions. The BPIP input and output files are available on the CD-ROM located at the end of this report. The README.TXT file identifies the contents of each file on the CD-ROM.

RECEPTOR SELECTION

A Cartesian grid with variable receptor spacing was used to evaluate impacts around the facility. The grid was constructed as follows:

- 50-meter (m) spacing along the ambient boundary/facility fence line
- 100-m spacing from the ambient boundary to a distance of 1.0 kilometer (km) from the grid origin
- 250-m spacing from 1.0 km to 3.0 km
- 500-m spacing from 3.0 km to 6.0 km

Additional 50-meter spaced receptors were placed in the area from the facility fence line out to 500-meters to ensure that the maximum modeled concentration is reasonably resolved.

The AERMOD Terrain Preprocessor (AERMAP) was used to calculate the receptor elevations and terrain maximums. The domain used to calculate terrain maximums extended out at least ten kilometers beyond the receptor grid in all directions.

The receptors used in the dispersion modeling analysis are shown on Figure 1 at the end of this report.

METEOROLOGICAL DATA

Modeling was conducted using surface meteorological data collected at the Pocatello airport (processed with Boise upper air data) during the period 1988 through 1992. The data were provided by the IDEQ-AQD and one change was made to the data. The AERMET version number in the header information of each file was changed from 04300 to 06341 to enable AERMOD to run.

BACKGROUND SOURCES

Per guidance received from the IDEQ-AQD, co-contributing sources (nearby sources) were not included in the air dispersion modeling analysis. Monitored air quality data were used in lieu of modeling background sources.

AMBIENT BACKGROUND CONCENTRATION

An ambient annual background concentration of $17.0 \mu\text{g}/\text{m}^3$ was added to the NO_2 modeling results to determine compliance with the NAAQS. This concentration represents the default rural agricultural area background concentration and should be considered a worst-case estimate of existing air quality in the Lava Hot Springs area.

NO_x TO NO_2 CONVERSION

NO_x impacts were converted to NO_2 impacts using the ambient ratio method. Annual NO_x impacts were converted to NO_2 impacts in accordance with the Tier 2 approach specified in the EPA *Guideline on Air Quality Models*: seventy-five percent conversion from NO_x to NO_2 was assumed.

RESULTS

Significant Impact Modeling

The significant impact modeling was conducted using only the Lava Hot Springs emissions increase. Five model runs were conducted for NO_x , one run for each year.

There were significant NO_2 impacts during each year and Table 3 identifies the modeled high impacts:

Table 3
Lava Hot Springs Significant Impact Modeling Results

| Pollutant | Averaging Period | Year | SIL ($\mu\text{g}/\text{m}^3$) | Modeled Impact ($\mu\text{g}/\text{m}^3$) |
|-----------------|------------------|------|-------------------------------------|--|
| NO ₂ | Annual | 1988 | 1.0 | 3.29 |
| NO ₂ | Annual | 1989 | 1.0 | 3.92 |
| NO ₂ | Annual | 1990 | 1.0 | 3.74 |
| NO ₂ | Annual | 1991 | 1.0 | 3.55 |
| NO ₂ | Annual | 1992 | 1.0 | 2.62 |

Cumulative Impact Modeling (NAAQS)

To evaluate compliance with the NAAQS and WAAQS, cumulative NO₂ annual average impacts were determined using Lava Hot Springs sources and a representative ambient background concentration provided by the IDEQ-AQD. Table 4 identifies the modeled cumulative impacts for comparison to the NAAQS:

Table 4
Lava Hot Springs NAAQS Cumulative Impact Modeling Results

| Pollutant | Year | Location UTMX (m) | Location UTMY (m) | Modeled Impact ($\mu\text{g}/\text{m}^3$) | Modeled Impact + Background ($\mu\text{g}/\text{m}^3$) | NAAQS ($\mu\text{g}/\text{m}^3$) | Percent of NAAQS |
|-----------------|------|-------------------------|-------------------------|---|--|---------------------------------------|---------------------|
| NO ₂ | 1988 | 410,700 | 4,720,250 | 8.07 | 25.07 | 100 | 25.1 |
| NO ₂ | 1989 | 410,750 | 4,720,250 | 9.59 | 26.59 | 100 | 26.6 |
| NO ₂ | 1990 | 410,750 | 4,720,250 | 9.14 | 26.14 | 100 | 26.1 |
| NO ₂ | 1991 | 410,800 | 4,720,300 | 8.54 | 25.54 | 100 | 25.5 |
| NO ₂ | 1992 | 410,800 | 4,720,250 | 6.29 | 23.29 | 100 | 23.3 |

Isopleth plots of the cumulative impacts are provided as Figures 2 through 6 at the end of this report. Note that these plots do not include the annual background concentration.

All model input and output files are available on the CD-ROM provided with this air dispersion modeling report. The README.TXT file identifies the contents of each file on the CD-ROM.

Table 5
Northwest Pipeline GP - Lava Hot Springs Compressor Station
Point Source Locations, Parameters and Emission Rates

| Source | Release Type | Source Description | X-Coord. (m) | Y-Coord. (m) | Elevation (ft) | Stack Height (ft) | Temperature (F) | Exit Velocity (ft/sec) | Stack Diameter (ft) | NOX Emissions (lb/hr) |
|--------|--------------|--------------------------------|-----------------|-----------------|-------------------|----------------------|--------------------|---------------------------|------------------------|--------------------------|
| T4002 | DEFAULT | Solar Centaur 40-4002 Turbine | 410623 | 4720193 | 4958 | 31.70 | 771.00 | 126.25 | 3.50 | 21.65 |
| T4700S | DEFAULT | Solar Centaur 40-4700S Turbine | 410623 | 4720167 | 4956 | 41.60 | 819.00 | 152.50 | 3.40 | 3.89 |
| T1300 | DEFAULT | Solar Saturn 10-1300 Turbine | 410584 | 4720155 | 4951 | 26.00 | 873.00 | 107.32 | 2.42 | 7.88 |

Table 6
Northwest Pipeline GP
Lava Hot Springs Compressor Station - Structure Dimensions and Locations

Compressor Building

Length: 70 ft
Width: 40 ft
Height: 33 ft

| | Distance (ft) | Distance (m) | Direction (deg) | X (m) | Y (m) | X (easting) | Y (northing) |
|-----------|------------------|-----------------|--------------------|----------|----------|----------------|-----------------|
| Corner #1 | | | | | | 410614.00 | 4720190.00 |
| Corner #2 | 40.00 | 12.1920 | 0.0833 | 12.19 | 0.02 | 410626.19 | 4720190.02 |
| Corner #3 | 70.00 | 21.3360 | 270.0833 | 0.03 | -21.34 | 410626.22 | 4720168.68 |
| Corner #4 | 40.00 | 12.1920 | 179.9167 | -12.19 | 0.02 | 410614.03 | 4720168.70 |
| | 70.00 | 21.3360 | 90.0833 | -0.03 | 21.34 | 410614.00 | 4720190.04 |

Auxiliary Building

Length: 48 ft
Width: 30 ft
Height: 21 ft

| | Distance (ft) | Distance (m) | Direction (deg) | X (m) | Y (m) | X (easting) | Y (northing) |
|-----------|------------------|-----------------|--------------------|----------|----------|----------------|-----------------|
| Corner #1 | | | | | | 410556.00 | 4720202.00 |
| Corner #2 | 48.00 | 14.6304 | 0.0833 | 14.63 | 0.02 | 410570.63 | 4720202.02 |
| Corner #3 | 30.00 | 9.1440 | 270.0833 | 0.01 | -9.14 | 410570.64 | 4720192.88 |
| Corner #4 | 48.00 | 14.6304 | 179.9167 | -14.63 | 0.02 | 410556.01 | 4720192.90 |
| | 30.00 | 9.1440 | 90.0833 | -0.01 | 9.14 | 410556.00 | 4720202.04 |

Sound Wall

Length: 50 ft
Width: 5 ft
Height: 15 ft

| | Distance (ft) | Distance (m) | Direction (deg) | X (m) | Y (m) | X (easting) | Y (northing) |
|-----------|------------------|-----------------|--------------------|----------|----------|----------------|-----------------|
| Corner #1 | | | | | | 410569.00 | 4720163.00 |
| Corner #2 | 5.00 | 1.5240 | 0.0833 | 1.52 | 0.00 | 410570.52 | 4720163.00 |
| Corner #3 | 50.00 | 15.2400 | 270.0833 | 0.02 | -15.24 | 410570.55 | 4720147.76 |
| Corner #4 | 5.00 | 1.5240 | 179.9167 | -1.52 | 0.00 | 410569.02 | 4720147.76 |
| | 50.00 | 15.2400 | 90.0833 | -0.02 | 15.24 | 410569.00 | 4720163.00 |

Table 6
Northwest Pipeline GP
Lava Hot Springs Compressor Station - Structure Dimensions and Locations

Saturn Turbine Skid

Length: 23 ft
Width: 6.3 ft
Height: 6.92 ft

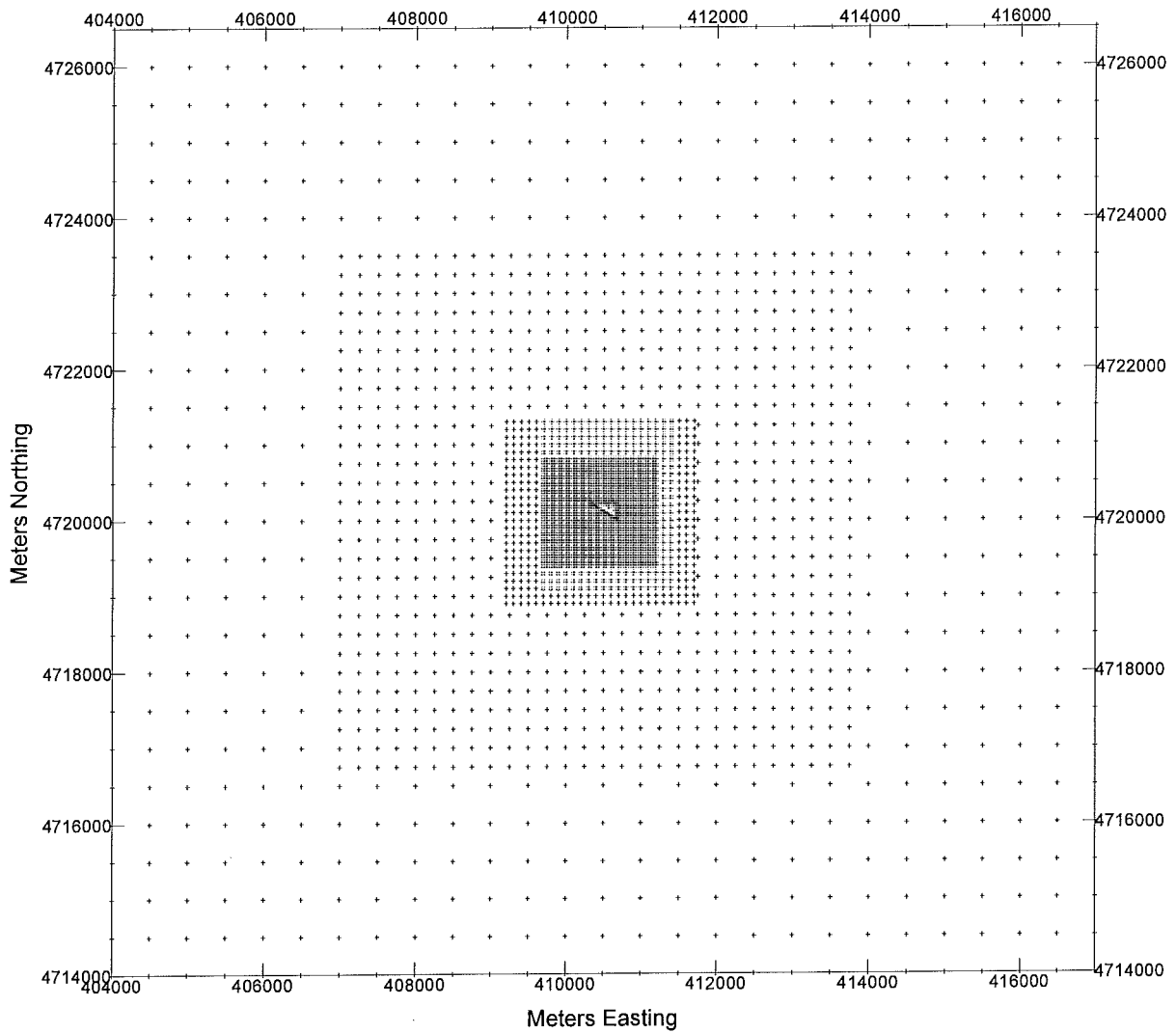
| | Distance (ft) | Distance (m) | Direction (deg) | X (m) | Y (m) | X (easting) | Y (northing) |
|-----------|------------------|-----------------|--------------------|----------|----------|----------------|-----------------|
| Corner #1 | | | | | | 410583.00 | 4720159.00 |
| Corner #2 | 6.33 | 1.9294 | 0.0833 | 1.93 | 0.00 | 410584.93 | 4720159.00 |
| Corner #3 | 23.00 | 7.0104 | 270.0833 | 0.01 | -7.01 | 410584.94 | 4720151.99 |
| Corner #4 | 6.33 | 1.9294 | 179.9167 | -1.93 | 0.00 | 410583.01 | 4720152.00 |
| | 23.00 | 7.0104 | 90.0833 | -0.01 | 7.01 | 410583.00 | 4720159.01 |

Meter House

Length: 15 ft
Width: 20 ft
Height: 15 ft

| | Distance (ft) | Distance (m) | Direction (deg) | X (m) | Y (m) | X (easting) | Y (northing) |
|-----------|------------------|-----------------|--------------------|----------|----------|----------------|-----------------|
| Corner #1 | | | | | | 410634.00 | 4720129.00 |
| Corner #2 | 15.00 | 4.5720 | 0.0833 | 4.57 | 0.01 | 410638.57 | 4720129.01 |
| Corner #3 | 20.00 | 6.0960 | 270.0833 | 0.01 | -6.10 | 410638.58 | 4720122.91 |
| Corner #4 | 15.00 | 4.5720 | 179.9167 | -4.57 | 0.01 | 410634.01 | 4720122.92 |
| | 20.00 | 6.0960 | 90.0833 | -0.01 | 6.10 | 410634.00 | 4720129.01 |

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Receptor Grid**

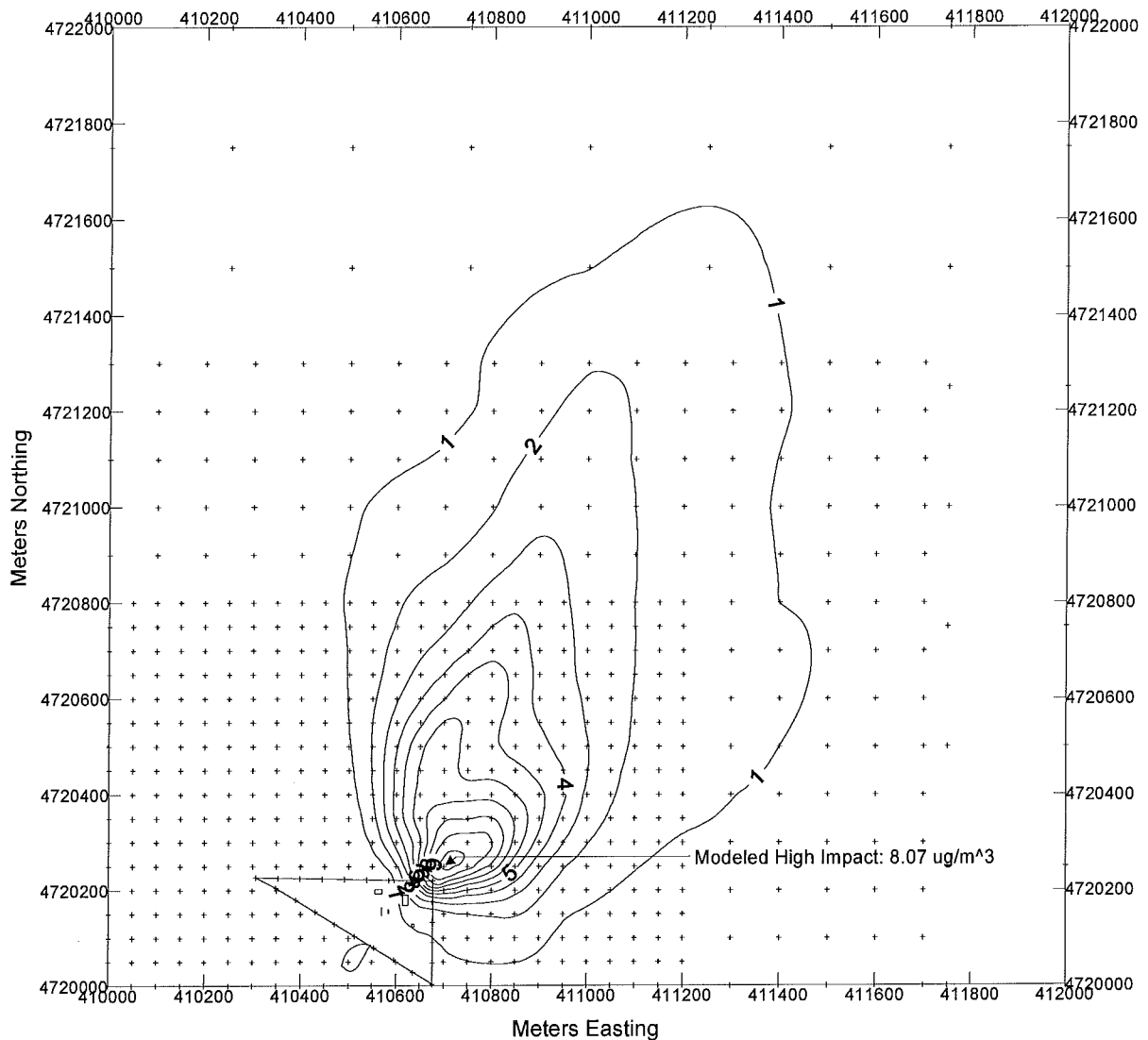


Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum

Figure 1

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Isopleth Plot of AERMOD Output**

**NO₂ NAAQS Impacts
Annual Average Impacts
1988 Pocatello Meteorological Data**

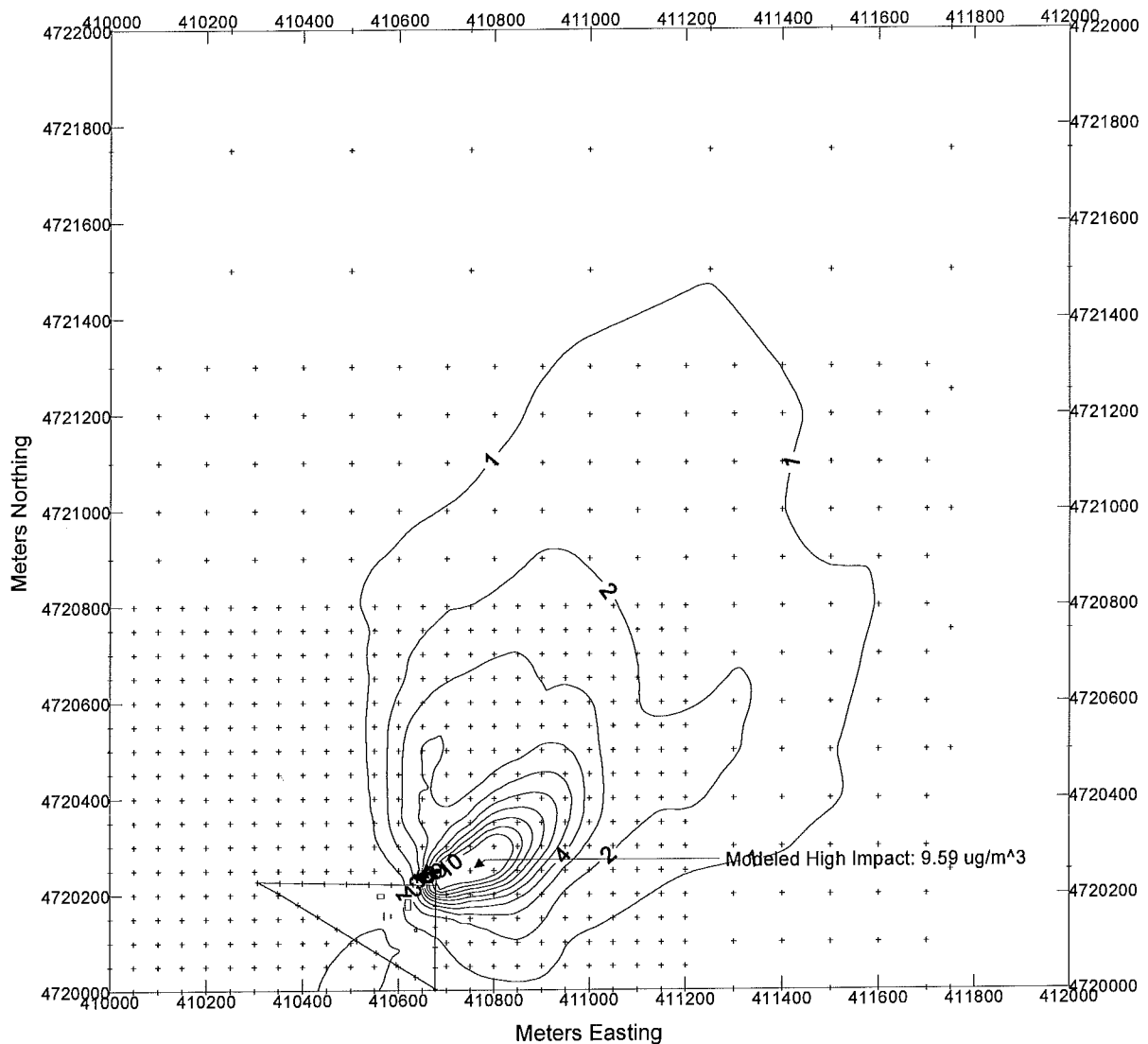


**Isopleths in Micrograms per Cubic Meter
Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum**

Figure 2

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Isopleth Plot of AERMOD Output**

**NO₂ NAAQS Impacts
Annual Average Impacts
1989 Pocatello Meteorological Data**

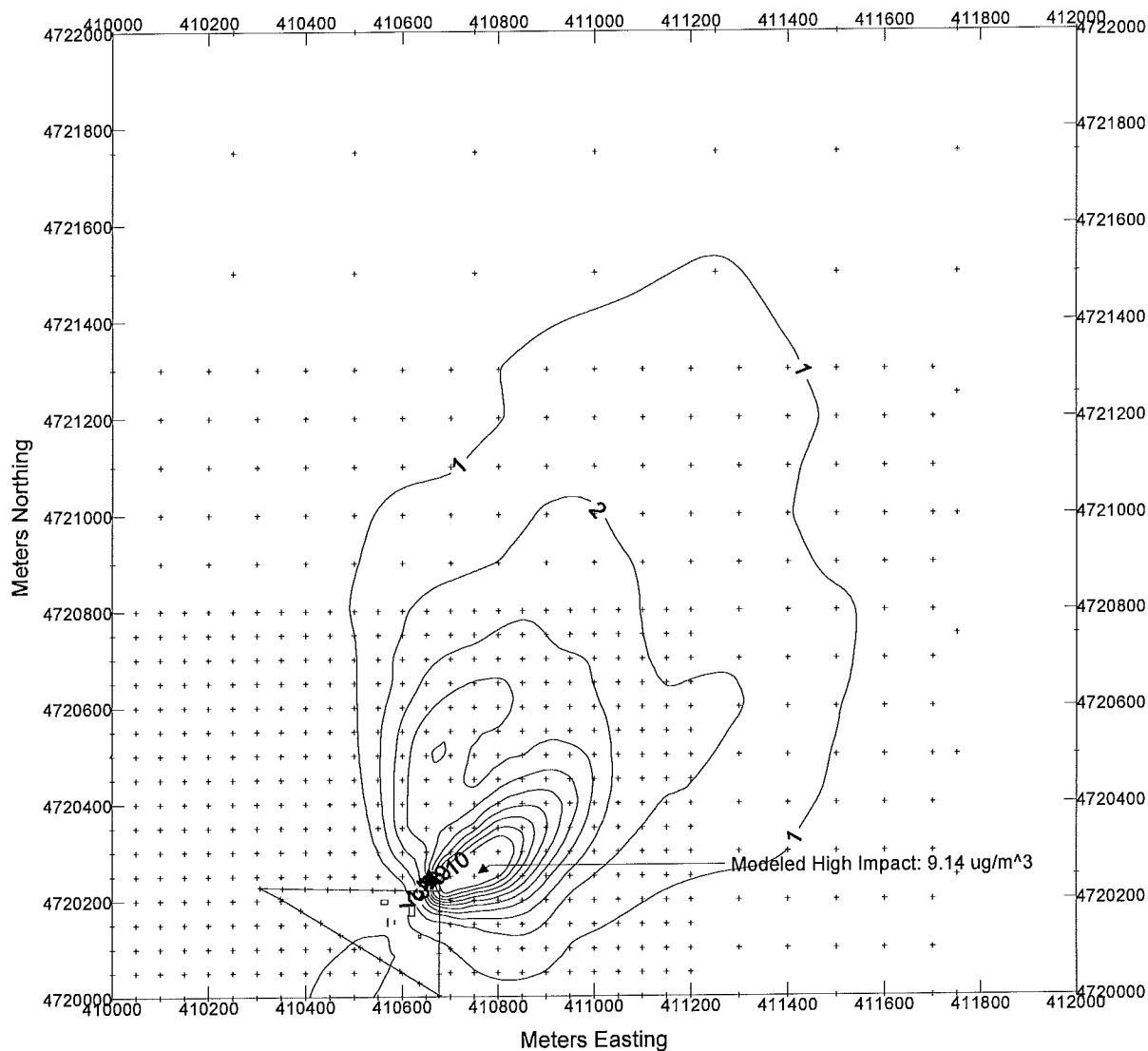


Isopleths in Micrograms per Cubic Meter
Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum

Figure 3

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Isopleth Plot of AERMOD Output**

**NO₂ NAAQS Impacts
Annual Average Impacts
1990 Pocatello Meteorological Data**

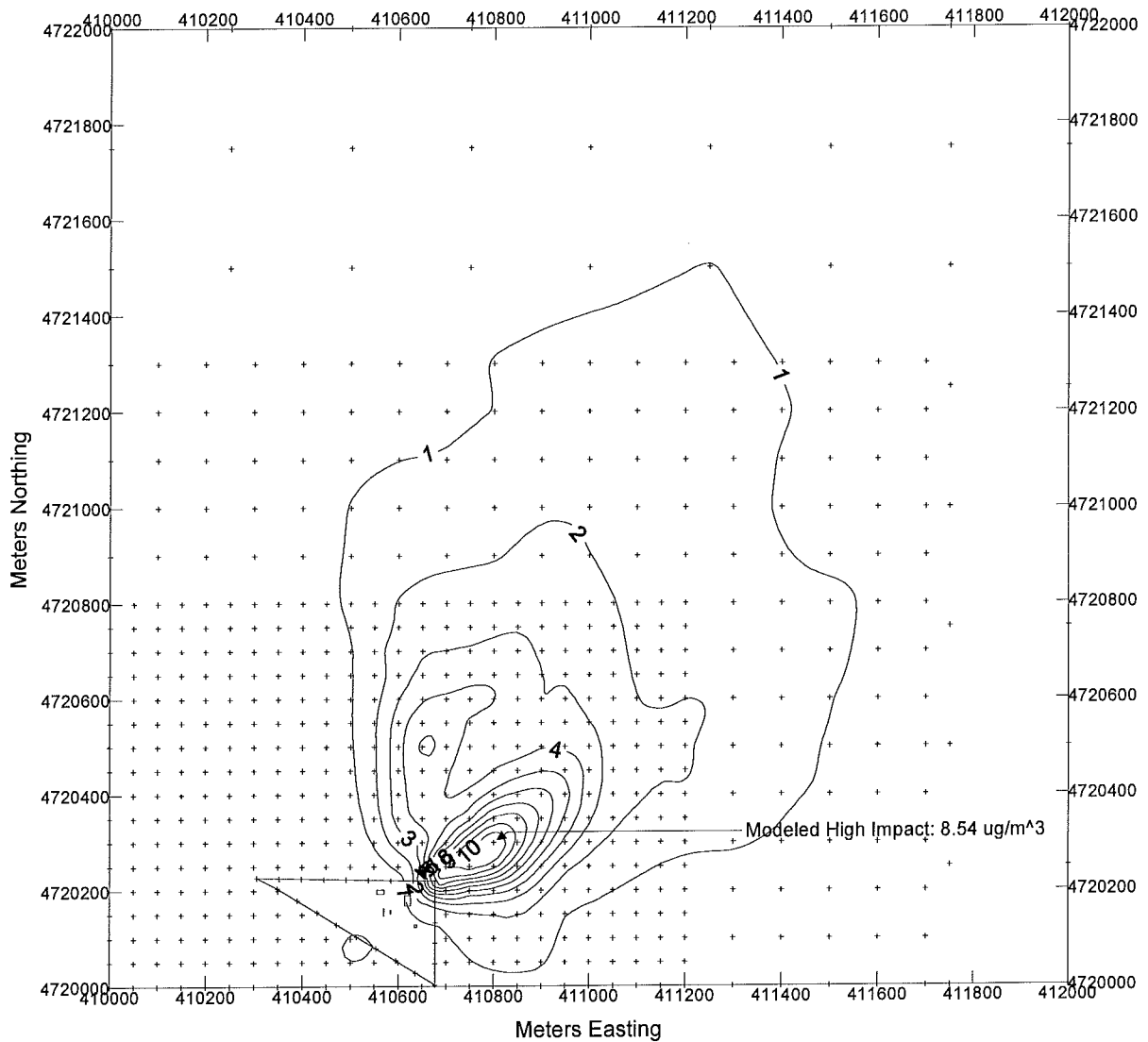


**Isopleths in Micrograms per Cubic Meter
Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum**

Figure 4

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Isopleth Plot of AERMOD Output**

**NO₂ NAAQS Impacts
Annual Average Impacts
1991 Pocatello Meteorological Data**

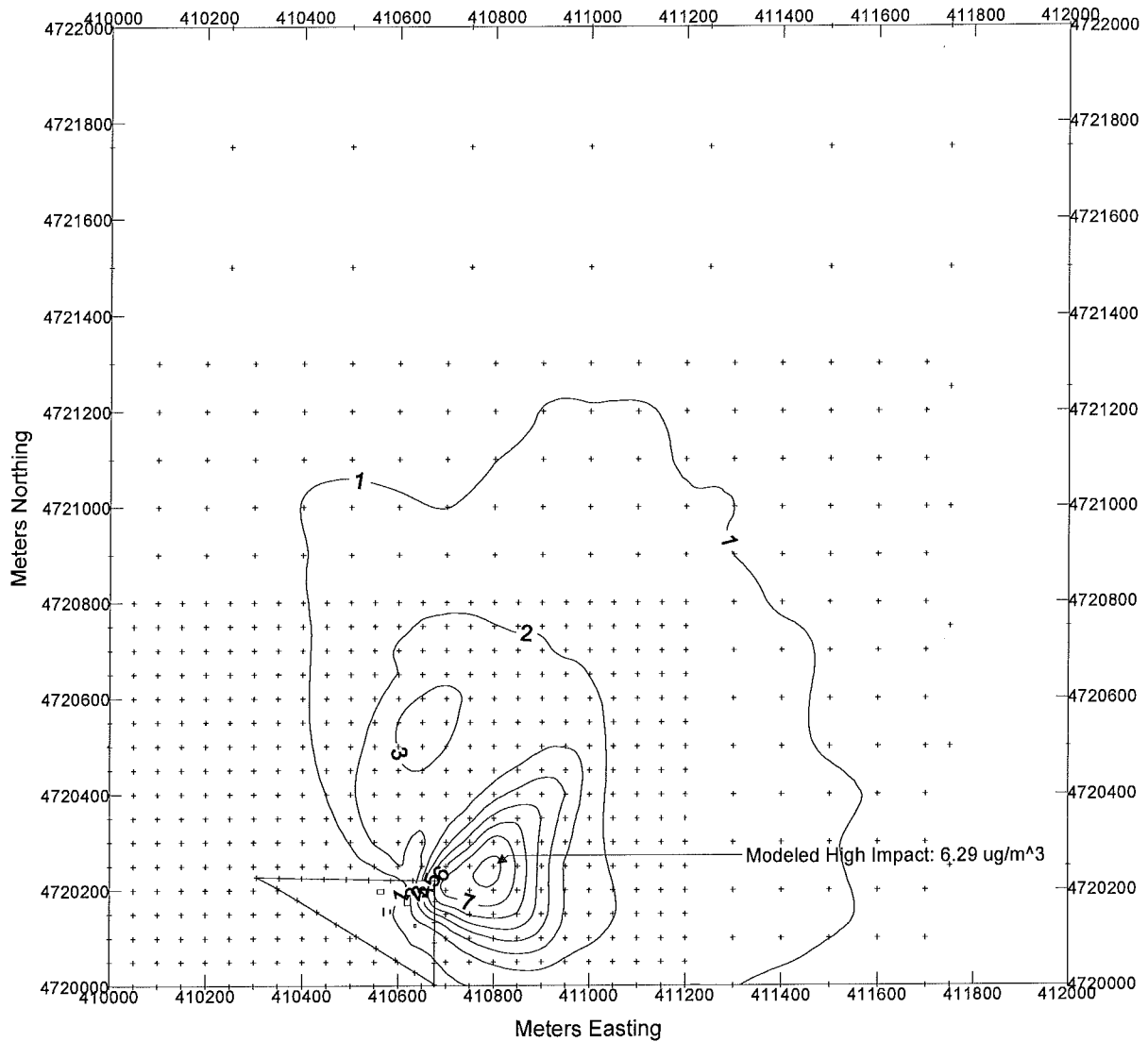


Isopleths in Micrograms per Cubic Meter
Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum

Figure 5

**Northwest Pipeline GP
Lava Hot Springs Compressor Station
Isopleth Plot of AERMOD Output**

**NO₂ NAAQS Impacts
Annual Average Impacts
1992 Pocatello Meteorological Data**

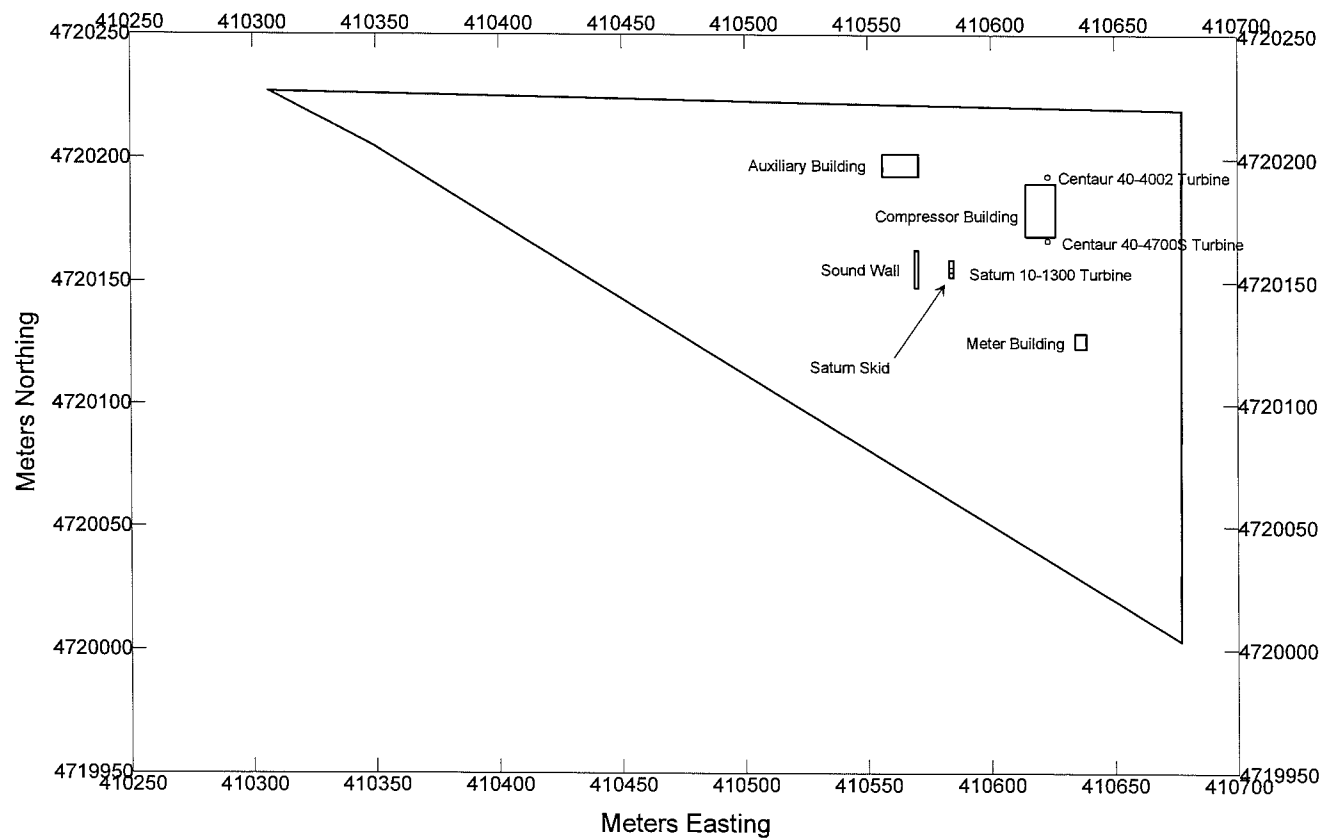


Isopleths in Micrograms per Cubic Meter
Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum

Figure 6

Northwest Pipeline GP Lava Hot Springs Compressor Station

Facility Plot Plan



Universal Transverse Mercator Coordinates, Zone 12, NAD 27 Map Datum

Figure 7

Appendix D
Legal Description and Plot Plan

Air Quality Permit to Construct Application
Lava Hot Springs Compressor Station
October 2008

Cirrus Consulting, LLC

2-1

595537

WARRANTY DEED

The Grantors, John Ivan Andrus Jr., and Margie Mae Andrus, Husband and Wife, for and in consideration of Ten Dollars (\$10.00) and other valuable consideration in hand paid, convey and warrant to NORTHWEST PIPELINE CORPORATION, its heirs, successors and assigns, the following described real estate, situated in the County of Bannock, State of Idaho:

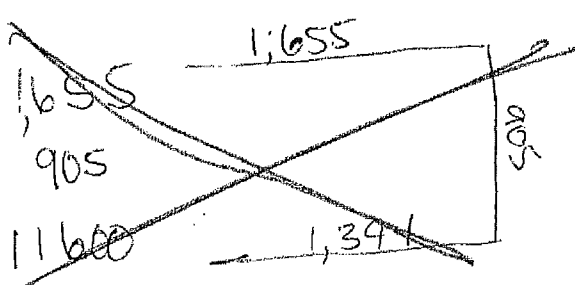
ADDRESS OF GRANT EE: P.O. Box 1526, Salt Lake City, Utah 84110

A tract of land in the Northeast Quarter, Section 23, Township 9 South, Range 37 E., B.M., Bannock County, Idaho, more particularly described as follows:

Commencing at the North Quarter Corner of Section 23, Township 9 South, Range 37 E., B.M.; thence North 89° 55' East along the North line of said Section 23 for a distance of 166.80 feet to the point in the Northerly Right-of-Way line of the Old Oregon Trail Highway, the true point of beginning; thence continuing North 89° 55' East along the North line of said Section 23 for a distance of 1655.69 feet; thence South 00° 05' East, 905.55 feet, more or less, to a point in the said Northerly Right-of-Way line of the Old Oregon Trail Highway; thence Northwesterly along the said Right-of-Way line following a curve to the right having a central angle of 19° 02', Radius of 1,116.00 feet, tangents of 187.16 feet and a chord of 369.16 feet, bearing North 68° 36' West for an Arc Distance of 370.86 feet to a point of tangency; thence North 59° 05' West along said Right-of-Way line for a distance of 1341.20 feet to a point of curvature; thence Northwesterly along said Right-of-Way following a curve to the left having a central angle of 9° 41', a radius of 1,071.80 feet, tangents of 90.81 feet, and a chord of 180.98 feet, bearing North 63° 56' West, for an Arc Distance of 181.19 feet to the point of beginning.

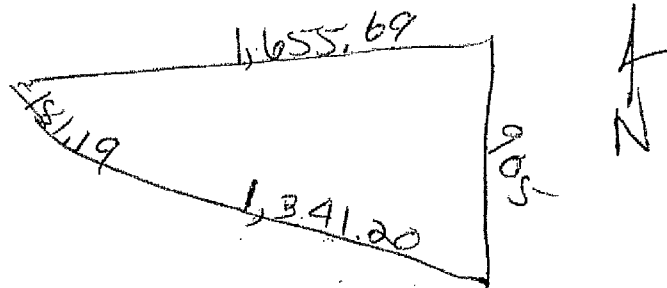
with all its appurtenances, subject to 1978 taxes payable in 1978 and all subsequent taxes and assessments; restrictive easements and covenants of record.

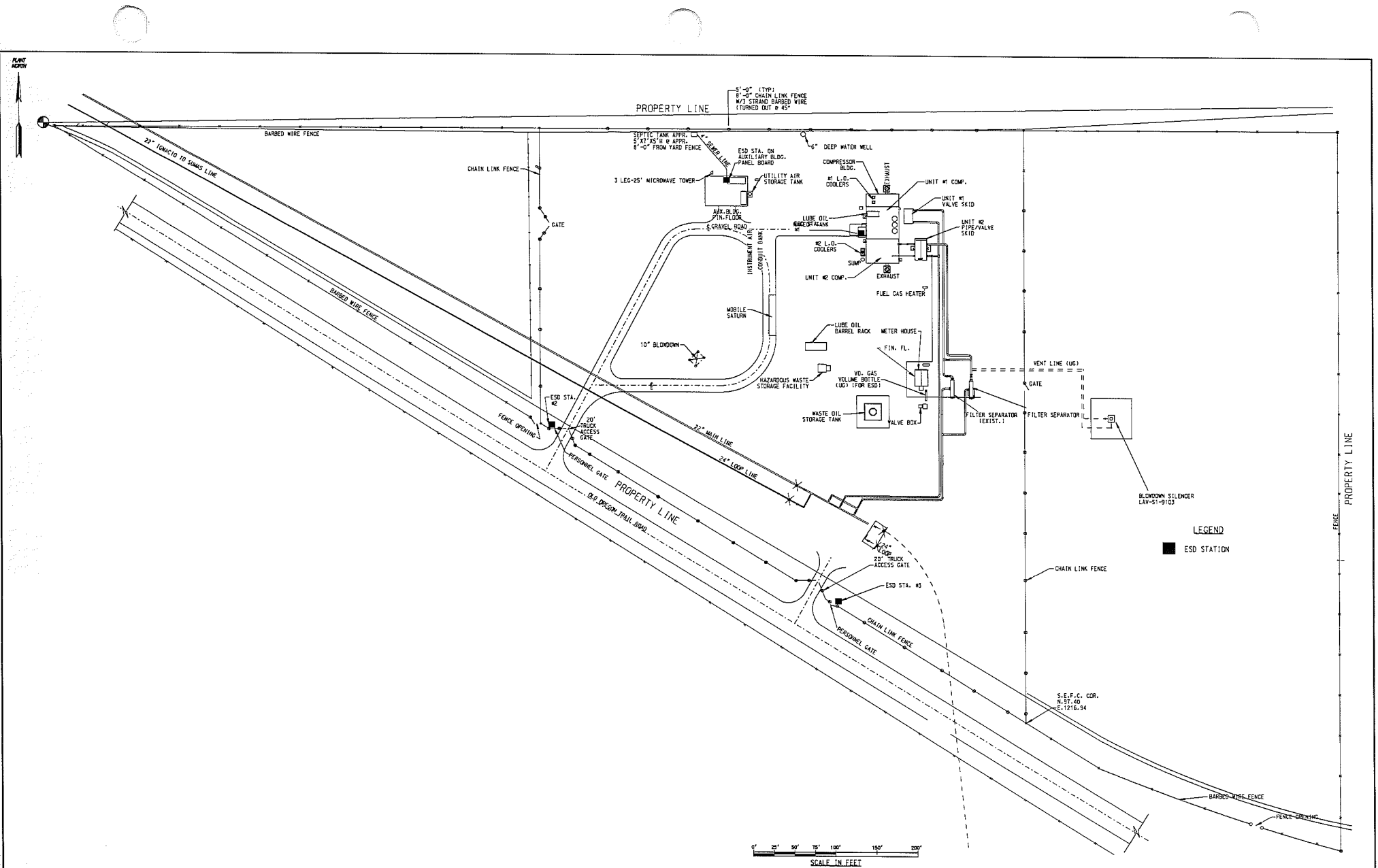
Dated this 2nd day of March, 1978.



John Ivan Andrus Jr.
John Ivan Andrus Jr.

Margie Mae Andrus
Margie Mae Andrus





| REFERENCE DRAWINGS | | | | REVISIONS | | | | NORTHWEST PIPELINE CORPORATION | | | |
|--------------------|-------|---------------|------|---------------|-------------|----------|------|--------------------------------|---|--|--|
| DRAWING NO. | TITLE | NO. | DATE | BY | DESCRIPTION | W.D. NO. | CHK. | APP. | LAVA HOT SPRINGS COMPRESSOR STATION | | |
| | | | | | | | | | EMERGENCY OPERATIONS PROCEDURES | | |
| | | | | | | | | | EMERGENCY SHUTDOWN LOCATION & EVACUATION PLAN | | |
| | | | | | | | | | BANNOCK COUNTY, IDAHO | | |
| DRAWN BY: PTL/AM | | DATE: 3-21-04 | | DESIGNED FOR: | | SCALE: | | WILLIAMS GAS PIPELINE | | | |
| CHECKED BY: DATE: | | DESIGNED FOR: | | SCALE: | | EXHIBIT | | | SHEET 1 | | |
| APPROVED BY: DATE: | | DESIGNED FOR: | | SCALE: | | EXHIBIT | | | OF 1 | | |

Appendix E
Topographic Map

Air Quality Permit to Construct Application
Lava Hot Springs Compressor Station
October 2008

Cirrus Consulting, LLC

**SEE ORIGINAL
APPLICATION
FOR PLOT PLAN**